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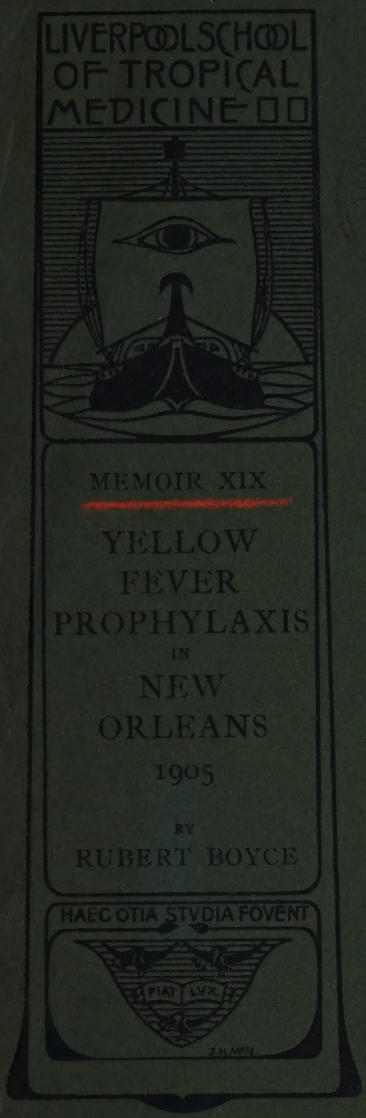

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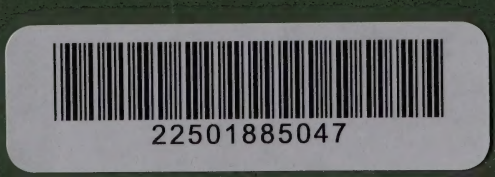
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YELLOW FEVER PROPHYLAXIS IN NEW ORLEANS

LIVERPOOL SCHOOL OF TROPICAL MEDICINE—MEMOIR XIX

YELLOW FEVER PROPHYLAXIS IN NEW ORLEANS

1905

BY

RUBERT BOYCE, M.B., F.R.S.

APRIL, 1906

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PREFACE

In this short history of the Yellow Fever Campaign in New Orleans in 1905, I have given an account of the measures which the inhabitants of that City adopted to stamp out the fever. I have made full use of the numerous documents with which I was freely furnished, and I reproduce very many of them with little comment of my own. The evidence shews in a very clear and simple manner how a large city of 330,000 inhabitants, suddenly realising that it was face to face with a serious outbreak, determined without hesitation to put into force the most recent prophylactic measures, to rigidly exclude all the older methods and theories, and to proceed at once to the complete extermination of the Yellow Fever mosquito. In adopting this plan of campaign there was never any hesitation or misgiving, the necessary funds were at once forthcoming, and all classes of the community heartily joined with the medical authorities in the attack. From beginning to end it was a determined effort to rid the City of the Stegomyia pest, and to remove once for all the reproach from the Port of New Orleans that it harboured the mosquito by means of which the disease alone could be propagated. The efforts were completely successful, and shew what can be done by a community, without recourse to force, in a mixed population and labouring under many other disadvantages.

The example of New Orleans, as well as of that of the successful campaign at Havana in 1900, and of the great improvements which have been brought about at Vera Cruz, Rio and other places, should stimulate all nations in the Yellow Fever zone to undertake the extermination of the *Stegomyia fasciata*. Considering the comparative simplicity and inexpensiveness of the methods necessary to be employed, the only excuse for the presence of Yellow Fever in any district must now be attributed to indifference. The practicability of the systematic extermination of the Stegomyia will also, in my opinion, pave the way to a far more determined and scientific effort to get rid of the Malaria-bearing Anopheles, towards which, unfortunately, a large section of mankind seem to have grown tolerant and apathetic, although it is now well known to be the greatest cause of the hindrance to progress in the tropics

I find it very difficult to thank individually the very large group of friends who shewed me so much kindness and gave me so much assistance whilst I stayed in New Orleans. I am deeply indebted to Dr. White, who was in charge of the campaign, to Dr. Warner, Chairman of the Ward Organisations, to Dr. Le Bœuf, the Chairman, and to his Colleagues on the Medical Advisory Committee, and to Mr. Behrman, Mayor of New Orleans. I was brought in contact almost daily with and received great help from the members of Dr. White's staff, and I tender to them my sincere thanks.

I am especially indebted to Dr. Richardson for much advice and assistance. I wish especially to thank my friend Dr. Paul Archinard, who allowed me the use of his laboratory, as also Drs. Matas, Pothier, Jones, Guthrie, Beyer, Perkins and Marks. I beg also to thank, for much valuable assistance, Mr. Janvier, President of the Yellow Fever Fund, Dr. Kohnke, President of the New Orleans Board of Health, Dr. Souchon, President of the State Board of Health, and the Secretary, Dr. Paton. For much personal kindness during my stay in New Orleans, I beg to thank Mr. Le Blanc, Mr. Liversedge, of the Elder, Dempster Company, the Manager of the United Fruit Company, Mr. Donnelly, the Acting British Consul, and many others who all contributed to make my stay in New Orleans of profit. For figures 2 and 6-11 I am indebted to Dr. White.

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YELLOW FEVER PROPHYLAXIS IN NEW ORLEANS

BY

RUBERT BOYCE, M.B., F.R.S.

INTRODUCTION.

IT is not my purpose in this account of the organisation and practical measures by which the epidemic of 1905 was successfully stamped out in New Orleans, to enquire in detail when and how the epidemic arose. This part of the history of the outbreak will, no doubt, be fully dealt with by the Local Health Authorities of the City of New Orleans and State of Louisiana, as well as by the Public Health and Marine Hospital Service of the United States. But I will at the outset, by reason of their practical bearing, take this opportunity of shewing the difficulties which are encountered in such an enquiry.

Previous Epidemics.

In the first place, New Orleans has suffered in the past from many outbreaks of the disease, as the following Yellow Fever mortality Table shews:—

Year.	Number of Deaths.	Year.	Number of Deaths.
1878	4000	1892	0
1879	19	1893	0
1880	2	1894	0
1881	0	1895	0
1882	4	1896	0
1883	1	1897	298
1884	1	1898	57
1885	1	1899	23
1886	0	1900	One suspicious case
1887	0	1901	0
1888	0	1902	0
1889	1	1903	0
1890	0	1904	0
1891	0		

The epidemic of 1878 was very severe, and the total number of recorded cases reached 13,086; in all probability, however, the number was in reality very much greater, the milder cases

passing unrecorded. Those who survived this epidemic were regarded as immunes, and to this fact may reasonably be attributed the long interval of comparative immunity which New Orleans subsequently enjoyed. From 1897 to 1900 the Yellow Fever Returns became again more numerous, 298 deaths being certified in 1897. From 1900 up to the recent epidemic no deaths appear on the list. Thus, whilst the above table shews the liability of the City to Yellow Fever, it also demonstrates that the latter could not be regarded as endemic in New Orleans. This liability to Yellow Fever has arisen from two causes. Firstly, proximity to countries in which Yellow Fever is either endemic or of frequent occurrence, and secondly, presence of the conditions necessary to the propagation of the disease in the City itself.

Relationship of the Trade of New Orleans to Yellow Fever.

The sea trade of New Orleans is very large, and there is a constant intercourse with Mexico, Cuba and the Central American Republics. Ships from Vera Cruz, Colon and other Gulf and Central American Ports have frequently arrived at the Mississippi Quarantine Station or at Ship Island with a passenger or member of the crew suffering from Yellow Fever, or developing the symptoms shortly after arrival in quarantine. The following list compiled from 1905 shews the reality of this method of transport of the disease:—

July 11—S.S. Royal Exchange	from	Colon	1 case
July 12—S.S. Sapphir	,,	Colon	1 ,,
Aug. 6—S.S. Texan	,,	Vera Cruz	1 ,,
Aug. 15—S.S. Puerto Rico	,,	Vera Cruz	1 ,,
Aug. 20—S.S. Sapphir	,,	Colon	3 cases
Sept. 1—S.S. Origen	,,	Colon	1 case
Oct. 26—S.S. City of Tampico	,,	Vera Cruz	1 ,,
Oct. 27—S.S. St. Croix	,,	Vera Cruz	1 ,,

These cases were all detected at the Mississippi Quarantine Station, but the possibility of a sailor or passenger eluding vigilance early in the year and reaching New Orleans and infecting the Stegomyia in the City cannot be altogether excluded. This is not, moreover, the only way in which ships may transfer Yellow Fever, they may also act as the carriers of infected mosquitoes, and although we have evidence that this was of far more frequent occurrence in the old days of sailing vessels than at the present day, there still exists the possibility of this method of mosquito transference. Carter, from

his experience at Ship Island, gives a list of vessels in which cases of Yellow Fever developed on board on their way from Rio, showing that infected mosquitoes were on board, and Dr. Grubbs, from observations extending over five months at the Gulf Quarantine Station on Ship Island, found that out of 82 vessels examined between June 1st and November 1st, of which 78 were sailing vessels and 4 steamers, that 3 sailing vessels contained the *Stegomyia fasciata* on arrival. The mosquitoes had evidently come on board at Vera Cruz, the port of departure; in one of these ships they were breeding in enormous numbers in the water barrels. Dr. Souchon instituted an examination of the fruit vessels during the quarantine season of 1902, and as a result found that out of 12 vessels making 180 trips between New Orleans and Central American ports, the *Stegomyia fasciata* was present 5 times, and on the vessels running between Havana and New Orleans 10 times. There is a possibility, therefore, of the transportation of the infected *Stegomyia fasciata* in ships; at the same time the evidence would appear to indicate that the probability is not very great. Still less appears the possibility of the transference of mosquitoes in baggage (Reed, Grubbs, Gill and Souchon.)

In addition to its vulnerability by sea, New Orleans is also liable to invasion on the land side, and that, too, in spite of rigid quarantine, for everything will depend on the earliness of the application of this measure of defence. The danger, as is well known, arises from cases passing the frontier before the real nature of the disease has been determined and, therefore, before the application of strict precautions. "While simple in theory, land quarantine may prove a very difficult problem in practice, even when backed by an overwhelming public sentiment and ample means." (Report, Louisiana State Board, 1902-1903.)

Conditions obtaining in New Orleans prior to the 1905 Epidemic.

In the second place favourable conditions existed in New Orleans for the concealment and spread of the disease. New Orleans has an estimated population of 325,000, of which 239,000 are white and 86,000 coloured. Owing to the demand for labourers there has grown up a very large Italian and Sicilian population in and around New Orleans which still takes insufficient share in the civic life of

the place. The poorer unassimilated members of this imported population are suspicious and very averse to seeking medical aid, and cases of Yellow Fever occurring amongst them might never have been brought to the notice of the Health Authorities. The district in the neighbourhood of the French Market where they chiefly congregated, and known as "Little Italy," had become very dilapidated. Human beings and animals were herded together in close proximity, the court yards were littered up with rubbish, consisting of rotting wood, tin cans, bottles, and disused tubs, which had been allowed to accumulate during many years, owing equally to the very inadequate sanitary supervision and the absence of a proper system of refuse removal, no doubt also to the habits of the people. No proper drainage existed in the yards, the closets were very dilapidated, and were constructed on the cess pit or pail system. The whole neighbourhood overcrowded, foreign, insanitary, and superstitious, constituted the most favourable nidus in the City for any infective process to take deep root and spread, provided the Stegomyia was also present. Moreover, every yard contained one or more large unprotected water receptacles which gave rise to immense numbers of the *Stegomyia fasciata*, which, after they emerged from the pupa stage immediately sought refuge and blood in the overcrowded living rooms a few feet distant.

In the streets in the older part of the town the sanitation was comparable to the condition of the houses. The paving of the roads was exceedingly bad and irregular (fig. 2), and allowed of the formation of numerous pools after rain. An open drain on each side of the roadway contained for the most part very slowly moving or stagnant putrescent water. The sewage fungus, *Sphærotilus natans*, and the red worm (*Chironomus*) were prominent everywhere where there was the least current. An abundance of solid decomposing refuse partially blocked them up at frequent intervals. Every now and then drains were "cleaned out" and the sludge was deposited on the roadway, often to be allowed to remain on the street till it had been completely scattered, or had found its way back to the drain again. The result of the absence of a proper system of garbage and sewage disposal was the production of an all-pervading odour of sewage, impossible to dissipate in the close and intensely hot summer months.

This condition of affairs contrasted remarkably with the better

MAP I. The infected blocks are most numerous in the old, Italian, quarter of the City.

residential parts of the City where each house had plenty of space around it and where no refuse was allowed to accumulate.

No wonder then that a focus like the above of non-immunes should constitute a serious danger to a large community liable to Yellow Fever. The essential factors were at hand to favour an outbreak; the fever started in this district and had gained a firm hold by July 22nd, when it was officially announced. How long it had been present it is difficult to say; subsequent hunting up of cases of illness would shew that there had been a very considerable number of suspicious cases and deaths, and that these might date from as early as May 13th. One thing certainly is clear, that by July 22nd the infection was not confined to one block, but had already made for itself several foci in the old part of the town. The subsequent history of the epidemic shews that the fever centred amongst the Italians, who furnished the largest number of cases and deaths (Map I). In this connection it is noteworthy to record that in the great epidemic of 1853 the chief sufferers appear to have been the Irish and German labouring population, no less than 3,907 deaths being registered amongst them, whilst only 87 deaths were stated to have occurred amongst the natives of New Orleans.

It will be gathered from these introductory remarks that given the conditions obtaining in New Orleans, it would be very difficult to say when Yellow Fever was introduced, or to lay the blame for the introduction of the disease upon any one place like Belize or Puerto Cortez, through failure of the local medical representatives of the United States to notify the disease at an early enough date. After my stay in New Orleans I had to investigate the outbreak in British Honduras, and subsequently I took the opportunity of visiting Livingstone, Puerto Barrios and Puerto Cortez. I found the same great difficulty in ascertaining with certainty when the disease originated and how it was introduced. Adjacent countries blamed one another. There was little question that, as has been so often the case, the early cases were not recognised and that the outbreak of Yellow Fever was not expected. Upon investigation, I came to the conclusion that great credit was due to the late Dr. Carson, attached to the United States Marine Hospital Service at Belize, for the early and prompt manner in which he acted. Recrimination is of little use: the fact remains that a great Port like New Orleans, with its immense

business interests, was harbouring and breeding every year the *Stegomyia fasciata*, and that it had a large foreign and a growing population living under the most insanitary conditions, and amongst whom it was easy to hide disease. Under such circumstances it was fatal to trust to quarantine alone, no matter how well organised, or how free from Yellow Fever New Orleans had remained for many years.

I now pass to the account of the measures which the people of New Orleans took to stamp out the epidemic; they constitute, in my opinion, the most brilliant demonstration upon a most extensive scale of the application of modern sanitary teaching to the arrest and prevention of Yellow Fever. The example of co-operation and energy which the people of New Orleans set this year should be followed by every town in the Yellow Fever zone with a feeling of absolute confidence that the loyal carrying out of the same measures will eradicate Yellow Fever wherever it is found.

Basis of Yellow Fever Prophylaxis.

The foundation of exact Yellow Fever prophylaxis was laid in June, 1900, by Army Surgeons, Reed, Carroll, Agramonte and Lazear, who were sent to Cuba to study Yellow Fever. In Havana these observers found that already Dr. C. J. Finlay had, as early as 1881, enunciated the theory in no uncertain manner of the propagation of Yellow Fever by the mosquito, and influenced both by this and, as they state, also by the brilliant work of Ross and Italian observers in connection with the propagation of malaria by the mosquito, as well as by certain observations of Carter,* they determined to experimentally investigate this line of research. The results obtained by them were most conclusive. In the same year the Liverpool School of Tropical Medicine despatched Drs. Walter Myers and Durham to study the disease at Para; France followed immediately (late in 1901) with an Expedition composed of Drs. Marchoux, Salimbeni and Simond, which made Rio its headquarters. In 1904 the Hamburg School of Tropical Medicine sent out Drs. Otto and Neumann, who also made Rio their headquarters. In 1903 a Yellow Fever working party composed of Rosenau, Beyer, Parker, Pothier and Francis was sent by the Public Health and Marine Hospital Service to study the

* New Orleans Medical Journal, 1900.

transmission of Yellow Fever at Vera Cruz. Lastly in 1905 the Liverpool School of Tropical Medicine has established for a second time a Yellow Fever Laboratory at Para under the direction of Dr. Thomas, assisted by Dr. Breinl. The conclusions arrived at by these Commissions, as well as by Dr. Guiteras in Havana and Drs. Lutz, Ribas, Barreto, de Barros and Rodriques in Brazil, have all fully confirmed the original observations of Reed, Agramonte, Carroll and Lazear, and have proved that the *Stegomyia fasciata* is the sole transmitter of the disease. The enthusiasm and devotion of this army of workers is shown by the fact that a very large number of the workers suffered themselves from the disease, and that Walter Myers and Lazear succumbed. Reed, one of the most brilliant of this group, unfortunately died at Washington from appendicitis in 1902, hardly before he had had time to witness the beneficial results of his remarkable labours. The flood of new light which was thrown upon the nature of Yellow Fever soon began to have its effect. The first great application of the new principle of prevention of Yellow Fever was made at Havana in 1901 by Major Gorgas, under the very able administration of General Wood. The result was a complete success; it has become historic and constitutes the example to every town in the Yellow Fever zone of the truth of the doctrine of the mosquito transmission and the practicability of its application. The example has been followed; under Dr. Cruz, in Rio, and Dr. Liceaga, in Mexico, great improvements have been brought about, but an immense amount of work still remains to be done. A new stimulus has, however, now been furnished by the successful campaign of 1905 in New Orleans, and it is to be hoped that a great deal of the opposition and apathy still to be met with will soon give place to hearty co-operation and determination to rid Yellow Fever countries of a pest which causes so much suffering and cripples commerce.

Prophylactic Measures adopted by New Orleans previous to 1905.

The Mosquito Survey of the City of New Orleans.

Shortly after the brilliant discoveries of Reed, Carroll and Lazear in Cuba proving the connection of Yellow Fever with the *Stegomyia fasciata*, the medical authorities in New Orleans not only commenced to advocate screening and oiling, but a Committee was appointed by the New Orleans Parish Medical Society to map out the mosquito breeding grounds in the City. The results of this investigation have proved of the greatest value to the present campaign (1905). Indeed the work of prophylaxis would have proved far more laborious had not this mosquito survey been made. The localisation enabled the authorities to inaugurate precise and well-directed measures against the Stegomyia without complicating and delaying the campaign in the commencement by an indiscriminate attack on all mosquitoes.

I would strongly advocate as the result of the findings of Havana and New Orleans that similar surveys should be made in all towns subject to Yellow Fever or Malaria.

The New Orleans Parish Medical Society* appointed a Commission in 1901 to investigate the mosquitoes of New Orleans with special reference to Malaria and Yellow Fever. Observations were also made by Dr. Veazie† and by Dr. Dupree,‡ of Baton Rouge, La.

The mosquitoes in New Orleans were, for sanitary purposes, conveniently divided by the Commission into three groups according to their breeding places, viz.:—Cistern, Gutter and Marsh Mosquitoes.

Cistern Mosquitoes.—The examination of 200 cisterns, barrels, troughs, tins found in the yards of houses in different parts of the City yielded the following results:—

Larvæ of Culex pungens	74
Culex stimulans	6
Culex pungens and Stegomyia	20
Culex stimulans and Stegomyia	4
Stegomyia fasciata alone	104
No mosquito larvæ	2

This shows that the *Stegomyia* was far the most common mosquito present. The *Stegomyia fasciata* was in fact the common cistern or house mosquito of New Orleans. It is essentially a town mosquito confined for the most part to

* Bionomics, experimental investigations with Bacillus Sanarelli and experimental investigations with Malaria in connection with the mosquitoes of New Orleans by Prof. Beyer, Drs. Pothier, Couret and Lemann, Jan., 1902.

† ‡ The Mosquitoes of Louisiana and their pathogenic possibilities with remarks upon their extermination. Dr. Dupree. New Orleans Med. and Surg. Journal, July, 1905.

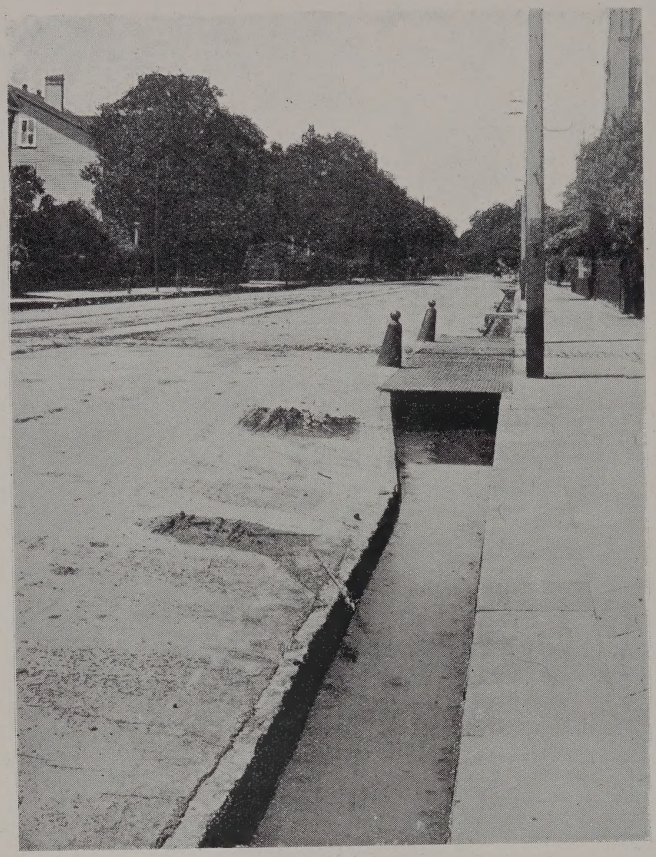


FIG. 1. A Street Gutter in the Suburbs, New Orleans.

FIG. 2. Roadway by the French Market, New Orleans.

the populated centres and less frequently found in the rural districts. Although preferably a cistern breeder it occasionally seeks out other places. The Medical Societies Commission found as the result of an examination of 21 street gutters, the Stegomyia no less than 16 times. If driven by screening and oiling from its usual breeding place in clean water cisterns the eggs appear to be able to develop not only in the contaminated water of the gutters, but even in concentrated fæcal matter (Dupree and others). Reed and Carroll found Stegomyia breeding in

(1) Rain water barrels,
(2) Sagging gutters containing rain water,
(3) Tin cases used for removing excreta,
(4) Cesspools,
(5) Tin cans placed about table legs to prevent the inroads of red ants,
(6) In the collections of water at the base of the leaves of the Agave americana. They state that the presence of fæcal matter is not objectionable. In the map of the mosquito distribution of New Orleans drawn up by the Commission it will be seen that the present epidemic of Yellow Fever corresponds with the Stegomyia distribution.

The Prevention of Yellow Fever, Medical Record, New York, Oct., 1901.

In Belize in British Honduras I found the Stegomyia breeding in immense numbers in the clean water receptacles, such as vats, iron tanks, barrels, kerosene tins and odd receptacles. I also found them breeding in the irregular pockets present in the logs of logwood which, being exposed to the rains, accumulated water. The stained, almost black, water in these crevices did not appear to prevent the development of the wrigglers. I also found them in a cooling water barrel by the side of the furnace in a blacksmith's shop, and the same observation was made in New Orleans during the epidemic. Altogether I examined in conjunction with Mr. Burchell, the Superintendent of Public Works, and Drs. Harrison and Heusner, of Belize, 836 separate lots in the town of Belize, in which there were present 1,342 barrels, 760 vats and tanks, 91 wells, and innumerable kerosene tins and odd receptacles. I took samples of the larvæ, unless the adult Stegomyia was found, and developed them in the laboratory, and, as the result, concluded that the Stegomyia was present in certainly 50 per cent. of the lots in the town. I never found Anopheles in these receptacles, and Culex comparatively infrequently. On the other hand Anopheles larvæ were present in the clean water pools and gutters in the streets and waste places, whilst Stegomyia was absent.

The Gutter Mosquito.

The open gutters, like the system of cisterns, are a feature in New Orleans (fig. 1). As previously mentioned, there is little or no

circulation in them, and they are rich in decomposing animal and vegetable matter. They constitute the breeding grounds of several species of Culex, of which the Commission found *Culex pungens* to be one of the commonest. This mosquito is not, however, confined to the gutters; it is found along the river, in the marshes and in all receptacles which can contain water. It is a very troublesome insect, common all the year round, and bites in the evening and nighttime. Other gutter breeders are *Culex consobrinus* and *Culex stimulans*. Associated with this group is the water-closet mosquito, *Culex impiger*, the larvæ of which require highly-polluted water to thrive in.

The Marsh Mosquitoes—Pools and Drainage Canals.

These comprise, according to the same observers, certain species of Culex and Anophelinæ. Amongst the former are recorded *C. confirmatus*, *C. tæniorhynchus*, and *Grabhamia sollicitans*.

Culex tæniorhynchus is a marsh mosquito, and a virulent biter, which often invades the City in large numbers and produces some dismay on account of its resemblance, in its black and white banded legs to the Stegomyia; the body markings are, however, quite different.

The most widespread breeders in the marshes, and which come only second to Stegomyia in their importance, are the Anophelinæ. As the Map II shews, they surround the City, being present along the river front and in the marsh-land on the sides and in the rear of the town. The Commission describes *Anopheles maculipennis* as essentially a swamp mosquito, never becoming domesticated in large centres of population, where dwellings are standing close together and the soil drained. It exists in large numbers in the outer districts of the City, but is only found in isolated instances in the City. They state that it cannot exist in the cisterns. They regard *A. maculipennis* as responsible for the tertian and quartan varieties of malaria, and the *A. crucians* for the pernicious or æstivo-autumnal fever.

THE STEGOMYIA FASCIATA.

This mosquito, which has been conclusively demonstrated to be the sole transmitter of Yellow Fever, is a very characteristic and familiar one throughout the Yellow Fever zone. It is surmised,

MAP II. Shows the Distribution of the Principal Mosquitoes of New Orleans.

(Reproduced from Report of Commission of Parish Medical Society of New Orleans, 1901.)

FIG. 3. A Water Cistern, New Orleans. It is a breeding place for the Stegomyia and is close to the living rooms.

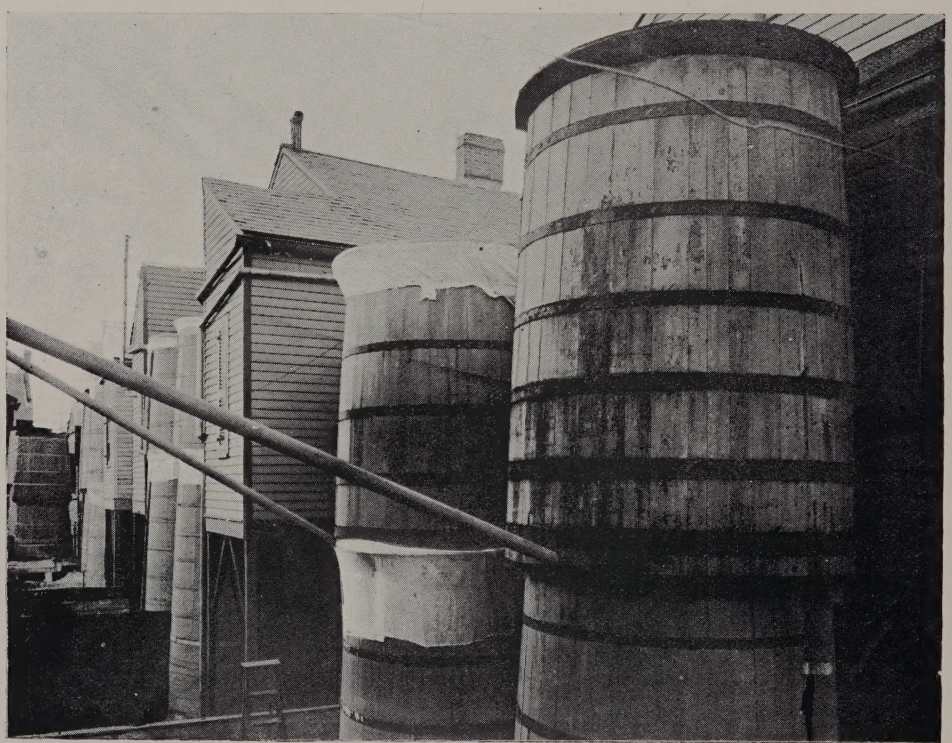


FIG. 4. Row of Water Cisterns, screened with cheese cloth, New Orleans. This long row of breeding places is close up to the houses.

however, that it was originally imported into the Southern United States from the Tropics through the medium of commercial intercourse. It is common on the coast towns along the Gulf, the Caribbean Sea, and on the Atlantic Coast of tropical and sub-tropical South America, as well as in other tropical and sub-tropical countries.

It is, therefore, a mosquito of the seaports, and this is one of the reasons why it is so essential to eradicate it, especially in view of the continual opening of new fruit ports in Central America and the West Indies. It is capable of flourishing over a wide area, and Dr. Howard, of Washington, states from collected observations that the species can flourish wherever the sum of the mean daily temperatures above 6°C. (43°F.) throughout the year does not fall below 10,000°C. It is not exclusively confined to the coast line, observation showing that in places where it is capable of surviving the winter, it readily spreads into the interior, following the trade routes, whether rail or river. It has already, it is stated, reached an altitude of 4,200 feet in Mexico (Yellow Fever Working Party, No. 1, 1903), and, as shewn by the great outbreak of Yellow Fever in the interior of Guatemala and Spanish Honduras in 1905, it has well established itself along the Puerto Barrios and Puerto Cortez railroads.

It is essentially a domestic mosquito, and, therefore, a mosquito of cities. Whilst the malaria-bearing anopheles is now confined to the outskirts of a large city like New Orleans, having been gradually driven away from the centre of the town owing to the building up of inhabited blocks, and to drainage, the Stegomyia, on the contrary, seeks the central and more crowded parts of the City, the places, in fact, where it finds the necessary and innumerable water receptacles in the closest proximity to the dwelling houses. The knowledge of this characteristic was of the utmost importance in the recent epidemic. It is, indeed, a cistern-breeding mosquito, and is often known on this account as the "cistern mosquito." It is found in abundance, therefore, in those places where rain-water is collected and stored for domestic purposes, no wonder, then, that it was present in New Orleans with its sixty to seventy thousand water vats.

The mosquito is readily recognised by the white bands upon the legs and abdomen, the lyre-shaped pattern in white on the back of the thorax, and the white spots on the sides of the thorax. It is due to the presence of these bands and spots that this black and white

mosquito is often called the "Tiger Mosquito." The females only suck blood, and they appear to attack man both during the day and at night; between 4 p.m. and midnight is stated by some to be their most active period. For this reason it is necessary to take precautions against them at night as well as by day. The Stegomyia is subject to seasonal variations, cold being the great factor in stopping biting activity and breeding. Below 75°F. development is retarded, and the eggs kept at a temperature of 68°F. do not hatch. It is for this reason that the onset of cold weather in New Orleans soon puts an end to Yellow Fever, and that the City is said to enjoy a natural immunity from December to May. Too much stress must not be laid upon this, however, as the fact remains that the mosquito readily survives through the winter. The distribution and history of this mosquito during these months require close investigation, and I trust that again the New Orleans Medical Society will take the matter up. Each female lays between 20 and 75 eggs on the surface of the water; these are minute, black and cigar-shaped; they are very resistant, and have been kept in the dry state for periods varying between 10 and 20 days, and freezing does not destroy their fertility. The eggs are, therefore, a ready means of tiding over the cold weather. Under suitable conditions of temperature the eggs hatch out, according to different observers in from 10 hours to 3 days. The result is the well-known "wiggle waggle," or "wiggle tails," the larval stage of the mosquito. The larvæ are very active and very sensitive, and very rapidly disappear from the surface of the water in the cistern if the least disturbance occurs. For this reason the water-barrel or vat must be approached gently if one is desirous of obtaining specimens and examining them, otherwise they wriggle very rapidly to the bottom. Another point has also to be borne in mind, and that is, that they cling to the sides of the receptacle and hide in the crevices so that it is by no means easy to get rid of them. Simply emptying the water out of the receptacle will not suffice; a very thorough rinsing and cleaning is necessary. The duration of the larval period is from 6½ to 8 days normally; but, of course, they may remain in the larval stage for a much longer period; for instance, I brought some specimens alive to Liverpool which I collected at Puerto Barrios in Guatemala, on October 26th. They were kept in a large test tube either in my pocket or in my living room, and they were exposed to

great variations of temperature, the cold increasing as I travelled from New Orleans to New York and from New York across the Atlantic to Liverpool. The journey occupied 25 days, and they were only supplied with clean water. The larval is succeeded by the pupa stage which lasts two days or under, and from the pupa arises the imago, or winged mosquito.

In comparison with the Culex and Anopheles, Stegomyia larvæ develop very quickly, and this is well seen if bottles containing mixtures of Culex and Stegomyia larvæ are put to develop, the latter will hatch out much more rapidly than the former.

The Infected Stegomyia fasciata.

A knowledge of the following facts are necessary to understand the application of the prophylactic measures which are now employed. The Yellow Fever patient is only capable of infecting the Stegomyia during the first few days of the onset of the disease, the period usually given is the first three days, although the French authorities extend the infective period. The Yellow Fever cadaver is non-infectious; in consequence the separate burial ground for Yellow Fever cases is needlessly harsh, quite unnecessary and unscientific. *At no stage can the Yellow Fever patient or the cadaver infect man directly.* In common with many other non-immunes I was almost daily in the Yellow Fever Emergency Hospital examining patients and assisting at post mortems, but no case of infection ever occurred amongst us. The well-screened Emergency Hospital, although crowded with patients and extremely hot, was, nevertheless, one of the safest places in New Orleans, because the Stegomyia was effectively shut out. No case of direct transmission from the patient to man has ever been recorded. The only one means is through the mosquito, as Ross also proved in the case of Malaria.

When the Stegomyia has taken a meal of blood from a patient in the infective stage it is not at once capable of transmitting by its bite the virus to a healthy individual. *A very definite number of days must elapse before the mosquito is itself infective, and capable of transmitting the virus; approximately this period is twelve days.*

Therefore, at the termination of the period of incubation in the mosquito fresh cases of infection may be expected to occur in those living in a house in which the mosquitoes were not destroyed.

The symptoms of disease will also not declare themselves in man at once, for as just seen in the case of the mosquito, an incubation period is also necessary in the case of man and the *period is usually five days.* Consequently an interval of a little over two weeks usually occurs before secondary cases manifest themselves in fumigated houses.

Difficulties of Combating the Disease in the Past.

It can be readily understood from the preceding remarks how hopeless and ineffective were the measures of prevention used in the past, and that, too, in spite of the fact that in the more recent periods, Listerian principles of disinfection were applied, carbolic acid and perchloride of mercury being freely used as disinfectants. For instance, although Major Gorgas had, previous to the advent of Reed, Carroll, Agramonte and Lazear, made a vast change in the sanitary condition of Havana, Yellow Fever was, nevertheless, not affected, it only *ceased after employing methods directed against the mosquito, viz.: fumigation and screening.* In Belize, during the recent (1905) epidemic, cases of Yellow Fever occurred amongst the best cared-for class of people living in the best residential houses, where the sanitary arrangements were excellent.

In the past from want of knowledge of the true method of transmission, rigorous house quarantine was enforced in the epidemic of 1878 in New Orleans, and vast quantities of disinfectants were used, clothing and baggage was disinfected or destroyed, but nothing but the frost—the natural means of preventing the activity and breeding of the mosquito—stopped the fever. Ships have been turned away with the dying on board or subjected for long periods to quarantine, thousands of tons of harmless stone ballast have been thrown overboard or disinfected, lest they should spread contagion.

Prejudice against Excavating and Dredging.

Excavations and dredgings from early periods have been regarded with the greatest suspicion, and by a New Orleans Ordinance it is forbidden to make excavations, clean out canals, or tear up the streets from May 1st to September 1st. This Act is a survival of the old theory of miasmata, and it has led to the postponement of most useful operations for the general good of the community. In his

annual report (1902) to the Health Board in New Orleans, the Medical Officer of Health states, "We assert our belief that excavations of soil in summer are innocuous, and we take pride in having been the first to permit work of improvement to continue uninterrupted and unhampered during the summer months." I found in Central America last summer (1905) that considerable prejudice existed against excavations and dredging, and that outbreaks of Yellow Fever were freely attributed to this cause. Needless to say, there is not the slightest scientific foundation for the alarm, and the supposed relationship is in reality an example of odd cases of coincidence. A little enquiry will at once show that Yellow Fever appears in places where no digging or dredging operations are in hand, and conversely, that excavating and dredging may take place every year in a port liable to Yellow Fever without any Yellow Fever occurring. There is no poison in the dredged or excavated material, and it can neither infect human beings nor mosquitoes. The idea probably arises from the fact of the well-known observation that malaria was frequently observed to break out amongst those engaged in canal or railway construction, or in other engineering enterprises on land, or in harbour construction works. In some of these operations terrestrial pools would probably be formed in large numbers and would become the suitable breeding places of Anopheles, but not of the Stegomyia. In any case the bringing together of a number of labourers in a tropical town, living in huts crowded together without any screening of the numerous water containers in order to protect them from mosquitoes, would at once favour the spread of Yellow Fever were it introduced. This has occurred, but is not due to the men turning over the ground or dredging the harbour, but to the fact that they were living under conditions which favoured the propagation of the Yellow Fever mosquito. That this is so a comparison between the monthly mortality on the Panama Canal zone to-day with that of 22 years ago under the old Canal Company is overwhelming proof.

In October 1884, under the French Company, there were 21 deaths and 84 cases of yellow fever amongst 2,706 non-immunes, in a total of 19,243 employees. In October 1905 amongst 4,000 non-immunes, in a total of 22,000 employees, there was no death and only one case.

Efforts to Exterminate the Stegomyia in 1901.

As early as July, 1901, the Board of Health of New Orleans took up the subject of mosquito extermination stimulated by the striking and remarkable results achieved by the Stegomyia campaign in Havana. Conferences were held, lectures given and the householder appealed to. A circular was officially issued to the citizens giving information concerning the life history of the Stegomyia, pointing out the necessity of oiling and screening the cisterns and that oiling should be done regularly. It was further shown that broken bottles, tins and disused tubs were also sources of supply. A certain measure of success attended the issue of these instructions, but soon apathy took place, householders raised objections, and precautionary measures were neglected. The experience acquired demonstrated to the Board "*the inutility of this class of propagandism, unsupported by special law.*" The efforts of the Board were then directed to securing proper legislation, but they were not able to accomplish this until they were in the midst of the present epidemic. It is very greatly to be regretted that in spite of the warning of the Medical Officer and of a large number of the medical men of the City, that little heed was paid to anti-mosquito measures. Had the City then taken effective steps, it would have been spared the recent epidemic.. Now, however, the lesson has been learnt, and there can be little doubt that, as the result, New Orleans will become a healthier and cleaner City, and one in which it will be impossible for Yellow Fever, if accidentally introduced, to spread, becoming as secure in this respect as Liverpool or London.

The Prophylactic Measures.

Announcement of the Outbreak.

Immediately after holding an Autopsy upon what proved to be a case of Yellow Fever, the official announcement, that Yellow Fever was present in New Orleans, was made on July 22nd, 1905, in accordance with an Act of 1898 which states that:—"In case any parish town or city, or any portion thereof, shall become infected with any contagious or infectious disease to such an extent as to threaten the spread of such disease to other portions of the State, the State Board of Health shall issue its proclamation declaring the facts," &c.

It is, however, of the greatest importance to note, both in connection with international sanitary rules and with the repeated and most recent pronouncements from Washington upon the absolute necessity of early notification, that on July 12th information had already been conveyed to the Health Authorities (both State and Municipal) by two medical men, of the existence of two very suspicious cases of fever. Dr. Kohnke, the Corporation Medical Officer, immediately investigated the situation, and stated that several days' investigation in the Italian quarters, where the suspected cases came from, "disclosed the presence of infection extending in spots apparently over an area of about five squares; the history of infection dating back several weeks, the character of the disease not being recognised by patients, and attending physicians." During this investigation the Medical Officer gave instructions for fumigation, and upon July 15th communicated the results of his observations to the State Board of Health, describing the prophylactic measures which he had set on foot, and requesting financial aid. As the result of his appeal he was supplied with funds, and orders were issued to commence the more systematic oiling of the cisterns. This was the first step at prophylaxis, but it was local and incomplete.

It is obvious, therefore, that by July 12th the disease had a firm hold of the Italian quarter, that it might well have been present in May, or early in June, and that when the official announcement was made on the 22nd of July of the presence of Yellow Fever, there were, in all probability, a very large number of cases in the City. Indeed, it has been officially estimated that about 100 cases of sickness occurred in the infected quarter prior to July 21st, a large number of which were probably Yellow Fever, and that some 20 deaths took place, of which many were doubtless from Yellow Fever.

In the interval between the 12th and the 22nd suspicion began to be generally aroused, that an outbreak of Yellow Fever was developing in New Orleans. Evidence of this is furnished by the fact that the President of the Medical Society, Dr. Le Bœuf, urged upon the Health Authority, on behalf of the Medical Profession, as early as the 15th the imperative necessity of immediate and stringent precautions.

The First Steps in the Campaign and the Organisation of the Resources of the City to Combat the Disease.

On Friday, July 21st, a meeting of the State and City Boards of Health, the representatives of the Public Health and Marine Hospital Service, and Health Officers from surrounding States, was convened by Drs. Le Bœuf and McGruder in order to reassure the public and to check the stringent and onerous quarantine precautions which had, on the rumours of the presence of Yellow Fever, been promptly taken by the surrounding States against New Orleans, although as yet no official declaration had been made. As an example of this promptitude, it is worthy of note that the State of Mississippi had issued a quarantine ordinance on the day of the meeting. Shortly after the meeting on Friday the first step in general medical organisation was taken by the appointment on the following day, July 22nd, of an *Advisory Board* consisting of the Chairman, Dr. Le Bœuf, and three other members of the New Orleans Medical Society, viz., Drs. Callan, Magruder and Œchsner. This Committee was appointed to co-operate with the Health Authorities and to help to the best of their judgment in the campaign ahead of them. It was now fully recognised by these representative medical men that much valuable time had already been lost, and that the prophylactic measures which had up to this time been adopted by the Health Authorities were neither sufficiently extensive nor precise. I cannot refrain from drawing attention to the fact that during the week or more which elapsed before the official notification was made, that there rests with the Health Authorities during that period, the grave suspicion that this want of prompt notification might have enabled infected Italians and others from the infected quarters to have left the City by steam or rail to spread infection elsewhere. The failure of New Orleans in this respect emphasizes what every International Sanitary Convention had drawn attention to, namely, the necessity of prompt notification of Yellow Fever. Without this, international and interstate sanitary laws cannot be administered in accordance with science, wisely and humanely.

On the evening of the 22nd the Advisory Committee, the Medical Officer of Health, and Dr. White, having deliberated together, issued the first authoritative and collective pronouncement upon the precau-

tions which were necessary to be adopted. The manifesto runs as follows:—

An emergency exists in our City to-day which demands the attention of every individual, with the view to limiting and preventing the spread of epidemic disease. It has been scientifically proved that the mosquito is the only means of the transmission of Yellow Fever, and measures should be especially directed against them. It is especially urged by the undersigned that the following simple directions be followed by the householders of this City for the summer months:—

First.—Empty all unused receptacles of water. Allow no stagnant water on the premises.

Second.—Screen cisterns, after placing a small quantity of insurance oil (a teacupful in each cistern) on the surface of the water.

Third.—Place a small quantity of insurance oil in cesspools or privy vaults.

Fourth.—Sleep under mosquito nets.

Fifth.—Screen doors and windows wherever possible with fine screen wire.

(Signed) QUITMAN KOHNKE,
Health Officer.
J. H. WHITE,
Surgeon, U.S.P.H. and M.H.S.
ADVISORY COMMITTEE,
Orleans Parish Medical Society.

On the same day the authorities, realising that New Orleans was unprovided with a Fever Isolation Hospital, took steps to acquire an old house in the infected quarter in the Italian district. It seems, of course, very extraordinary that in the twentieth century and in a Port of the great importance and size of New Orleans that no proper provision should have existed for the isolation of infectious cases. There is no doubt now, however, after having paid dearly for their experience, that the Citizens of New Orleans will not in future allow this defect to go unremedied.

The Hospital received its first patients on July 26th, and in spite of the fact that it was placed in the midst of most insanitary surroundings and overcrowded, it, nevertheless, answered its purpose very well, owing to the very rigid precautions against the possibility of mosquitoes becoming infected from the patients. It was, indeed, a most striking demonstration of the harmlessness of the disease in the absence of the Stegomyia; several non-immunes, including myself, spent a portion of each day in the wards, but in no instance did infection arise. The entrance to all the wards was barred by double screened doors, so that one set of doors were closed before the second set were opened. A few weeks after the opening of this hospital, it became necessary to change into another temporary makeshift.

This time the premises were larger, more airy and situated amongst more sanitary surroundings. Owing to the fever subsiding it had, however, far less work to do than the former. There is no doubt that the emergency hospitals did magnificent service, and that the greatest credit was due to Dr. Jones, Dr. Paul Archinard, Dr. Guthrie, and to those who assisted them in a most arduous and difficult task, rendered still more trying owing to the hostility of the poorer classes of Sicilians and Italians.

Simultaneously with the formation of the *Medical Advisory Board*, a meeting was held in the Town Hall, under the auspices of the Mayor, of the State and City Health Officers and a number of citizens, prominent in business and in professional life, to review the fever situation, and to raise money. The outcome of the meeting was the successful launching, under the chairmanship of Mr. Janvier, of a Finance Committee—*The Citizens' Yellow Fever Fund Committee*—for the purpose of collecting funds to carry on the fight against the fever. On Sunday, the 23rd, the Rev. Dr. Warner from his pulpit took the first step in Anti-Yellow Fever propagandism amongst religious denominations, and on Monday, July 24th, the 14th Ward of the City organised and met together for the purpose of cleaning up and screening its own district, and for power to issue an advertisement "For bids to screen its 250 cisterns with copper gauze or cheese cloth, and for tenders to clean out the drains." All present at this meeting subscribed to the Ward Funds. Its example was immediately followed by the other wards, and thus was started the *Ward Organisation*, which was subsequently placed under the direction of Dr. Warner.

It will be now simple to trace the steps in the campaign if I follow the work of the several organisations:—

I.—The Local Medical Organisation.

II.—The Ward Organisation.

III.—The Public Health and Marine Hospital Service Organisation.

IV.—The Educational and Press Organisation.

V.—The Financial Organisation.

I.—The Local Medical Organisation.

Appeal for Civic Co-operation.

On Monday, July 24th, a Proclamation is issued, signed by the Mayor, and concurred in by the Medical Authorities, setting forth the situation and calling upon the Citizens to co-operate with the Health Authorities in stamping out the fever. It runs as follows:—

1. *The Mosquito Campaign.*

PROCLAMATION.

Mayoralty of New Orleans,
City Hall, *July* 24, 1905.

To the People of New Orleans:

The Health situation in this City is serious, but not alarming. Because of this situation, quarantine has been declared against New Orleans by several States and Cities. It is proper that the actual facts be recognised and dealt with resolutely and calmly.

It is authoritatively stated by eminent sanitarians that within recent years visitations of Yellow Fever, more widely spread than that which is in our City, have been successfully met and absolutely suppressed by methods whose potency has been demonstrated by ascertained results, and the application of which is simple. Those methods are now adopted by our own State and City Health Authorities, with the volunteer assistance of the United States Marine Hospital Service, and the Orleans Parish Medical Society of this parish. To the perfect and speedy success of the measures to be followed, the co-operation of every householder is necessary. That given, the people may confidently expect a speedy release from the trying conditions in which they are now placed, and from apprehension of its recurrence in the future.

I, therefore, as Mayor, urge all citizens and householders to render cordial and ready obedience to the instructions which may from time to time be given by the Health Authorities, and to render every aid within their power to those Authorities in the earnest efforts which they are now making, and in which they will persist for the absolute stamping out of this infection. Those instructions are not difficult of performance; they are easily to be understood, and can be followed with but little expense. Since the consensus of sanitary and medical opinion of to-day is that the infection of Yellow Fever is transmitted, or can be transmitted, only by means of the sting of the insect known as the "cistern mosquito," the following advice recently given by Dr. Kohnke, the City's Health Officer; by Dr. Souchon, President of the State Board of Health; Dr. White, Surgeon of the U.S. Marine Hospital Service, and an Advisory Committee of the Orleans Parish Medical Society, should be willingly and implicitly obeyed by every householder in this City.

First.—To keep empty all unused receptacles of water in every house, and allow no stagnant water on any premises.

Second.—To screen all cisterns after placing a small quantity of insurance oil (a teacupful in each cistern) on the surface of the water.

Third.—To place a small quantity of insurance oil in cesspools or privy vaults.

Fourth.—Sleep under mosquito nets.

Fifth.—Wherever practicable, screen doors and windows with wire screens of close mesh.

The foregoing advice may from time to time be given by the Health Authorities with more particularity. Whatever emanates from them must be accepted as given

for the good of the City and the preservation of every individual of its population, and should be respected and followed to the letter.

I repeat, upon the information of those qualified from actual investigation and scientific knowledge to speak upon this subject, that the situation in our City is not alarming, and that if it is treated by our people earnestly and intelligently, that this situation will soon be eliminated and demonstration will be made to the world that for the future the infection of Yellow Fever can have no permanent lodgement within the borders of the City of New Orleans.

MARTIN BEHRMAN, Mayor.

We concur in the above.

QUITMAN KOHNKE,
City Health Officer.

EDMOND SOUCHON, M.D.,
President, L.S.B.H.

J. H. WHITE,
Surgeon, P.H. and Marine Hospital Service.

ADVISORY COMMITTEE,
Representing Orleans Medical Parish Society.

2. *Appeal for Early Notification.*

On July 24th a most important notice is also issued to the members of the Medical Profession from the Orleans Parish Medical Society, and signed by the Advisory Committee, Dr. White, the Medical Officer, and the President of the Louisiana State Board of Health urging upon each medical man the absolute necessity of early notification and of reporting all cases of fever. It is unquestionably an exceptionally wise circular and touches a very weak spot. I reproduce it:—

ORLEANS PARISH MEDICAL SOCIETY,
NEW ORLEANS, LA.,
July 24, 1905.

DEAR DOCTOR,

We want to specially urge you to report all your cases of fever—malarial, typhoid fever or fever of any kind—during this summer, to the City Board of Health. It is absolutely essential to the checking of the spread of Yellow Fever in our City that all cases of fever should be promptly and conscientiously reported. Our patients, the public and the surrounding communities, will naturally look to our profession in this great emergency, and the responsibility rests in a great measure with us to check this condition, or at least to limit its too extensive spread. It is a well-known and scientifically proven dogma that the mosquito theory is to be accepted as a fact; then we must exert ourselves to the utmost to destroy the mosquito, the only host of transmission of Yellow Fever. Let us, then, make a consistent campaign against it, educate our patients regarding this situation and the danger of it, and direct them to place patients immediately under netting pending action of the Board of Health. Neither your patient nor the household will be subjected to the obnoxious house quarantine of several years ago.

Above all things, REPORT YOUR CASES PROMPTLY, to permit us to check any further foci of infection.

Even if you are not positive that the mosquito is the only source of transmission of Yellow Fever, give your City the benefit of the doubt in this important and vital matter. Respectfully,

EDMOND SOUCHON, M.D.,
President, Louisiana State Board of Health.
QUITMAN KOHNKE, M.D.,
Health Officer of the City of New Orleans.
J. H. WHITE, M.D.,
Surgeon, U.S. Public Health and Marine Hospital Service, in charge of the Government Measures.
ADVISORY COMMITTEE, ORLEANS PARISH MEDICAL SOCIETY,
John Callan, M.D., John F. Oechsner, M.D.,
M. J. Magrudger, M.D., L. G. Le Bœuf, M.D., Chairman.

3. *Appeal for Immediate Screening of Suspected Cases and Fumigation.*

This circular is speedily followed by another to the medical men, again urging the importance of early notification and careful fumigation. As regards the method of fumigation the circular is not so stringent upon this subject as subsequent experience found to be absolutely necessary to ensure safety.

ORLEANS PARISH MEDICAL SOCIETY,
DEAR DOCTOR, NEW ORLEANS, LA.

In an earnest attempt to work in harmony with the plan of procedure adopted by the Health Authority, and the U.S. Public Health and Marine Hospital Service, now being enforced in a general inspection of our entire city, we want to suggest to you, as your Advisory Committee acting with these bodies, that you report at once any case of fever in your practice remotely suspicious of being Yellow Fever. If you want to do your City the greatest good in this hour of trial, immediately constitute yourself as a Health Officer for the premises of the sick you are called to attend. Even before the regular Sanitary Inspector of the Board reaches the house, place the patient at once under a mosquito bar, pending further proceedings. Also order at once another room fumigated with sulphur—two pounds to the 1,000 cubic feet—and then thoroughly screen it. If it cannot be done in a perfect manner, at least order all the openings screened with either cheese cloth or other light material, well packed so as to allow no mosquitoes in the room. Keep only one door free, covering all the transoms in the same manner. On entering this door beat the air thoroughly with a cloth before opening. When the room is prepared, remove the patient to it, fumigating the room just vacated in the same manner.

After the first three days of the fever the Stegomyia fasciata cannot be infected from that patient, but we must be careful to keep the room well closed until the final fumigation or destruction of any mosquitoes which might have remained in the room. Look to the general hygiene of the house, inquire whether the cisterns or any other open receptacles of standing water about the premises have been properly oiled or screened. Act in this matter regardless of the work which will be done by the constituted authorities, for your own personal good and for the greatest good of your City. In other words, Doctor, take every possible precaution to protect all of your fever cases from being bitten by mosquitoes during the first three days of fever.

Our interest in this entire matter is the same as yours, and we must work for the same purpose. The part to be played by our profession is an extremely important one ; the faith and trust of the entire community is placed on our shoulders, and we must fully deserve the confidence reposed in us.

Very sincerely yours,
ADVISORY COMMITTEE, ORLEANS PARISH MEDICAL SOCIETY.

4. *Appeal for an Educational Campaign.*

Another circular is issued on the 24th, directed to the Board of Health, pointing out the necessity of a Campaign of Education, and urging the importance of asking the Clergy to especially disseminate knowledge from the pulpit in the matter of Yellow Fever. The circular then proceeds to give useful information in case of infection and finally appeals for united action in a general warfare against the Stegomyia.

NEW ORLEANS,
July 24th, 1905.

GENTLEMEN,

The condition existing at present is one that calls for the most strenuous, prompt and vigorous measures capable of institution. In view of the absence of the necessity for obnoxious local or house quarantine, the co-operation of physician and householder should be a matter of comparatively easy solution. A campaign of education should be boldly inaugurated. The clergyman, during his rounds and from his pulpit, should be a valuable agent in the dissemination of this knowledge. The Advisory Committee of the Orleans Parish Medical Society begs to recommend that the following measures be instituted at once, with the view of stamping out the few foci of infection of Yellow Fever which now exist in our City.

Cases of fever of any character developing in the infected area may be regarded as suspicious, and the patient immediately protected from mosquitoes. The house, cisterns, yards, drains, gutters, cesspools and vaults should be carefully inspected, and no breeding spots for mosquitoes should be overlooked.

The gutters and streets must not be neglected.

If the case proves to be one of Yellow Fever, the house must be screened and the rooms in the house other than the one occupied by the patient must be fumigated, to destroy all mosquitoes in them. When the case ends, either by recovery or death, the room occupied by the patient must be fumigated, for the same reason.

The success of these procedures will largely depend upon the promptness and earnestness with which mosquitoes are prevented from coming in contact with the patient and the destruction of all mosquitoes in the room after the patient is cured or dies.

The new foci of infection must be diligently sought and drastic measures adopted for stamping them out. It is only through the proper conciliatory education of the physician and the layman, and through their sincere co-operation, that anything can be accomplished.

For the vast portion of the City not infected, we recommend that a sufficiently large force of men be immediately organised to place oil in all unscreened cisterns, or other breeding places of mosquitoes, and distribute circulars amongst householders enlisting their co-operation.

All gutters should either be flushed or oiled.

An active, vigorous and persistent warfare on mosquitoes should, in our opinion, be immediately instituted from one end of the City to the other, as in this way localities now healthy may be kept so, even though foci of infection be introduced. We believe that the sanitary regeneration of this City depends entirely upon prompt and vigorous action on your part.

With the profoundest assurance of our heartiest co-operation with you in any movement to better the sanitary conditions of the City,

We beg to subscribe ourselves,

ADVISORY COMMITTEE, ORLEANS PARISH MEDICAL SOCIETY.

5. *A Warning to beware of the Danger of overlooking the less obvious Breeding Places of the Stegomyia.*

A very useful and practical notice is also sent out by the Advisory Committee directing attention to the importance of not overlooking possible receptacles of water in the house, as pitchers, flower pots, &c. It reads as follows:—

ORLEANS PARISH MEDICAL SOCIETY,
NEW ORLEANS, LA.

We desire to call your special attention to the wrigglers seen inside of the residences of people. Probably the public in the fight against the mosquito have directed all their efforts against the cisterns and the barrels or the outside containers, still a source of great danger also exists inside of the bedrooms in the water-pitchers, in the dining-room, or in the conservatory in the water-pots, vases or pots for plants. A frequent error and a great menace is the habit which some householders have of only partly emptying a water pitcher, and though it is refilled daily it is never emptied entirely, leaving always one-half pint or so for the larvæ to develop. Any physician in his daily rounds can see this illustrated by inspecting the various water-pitchers in the bedrooms.

On this same line we beg to again call your attention to the accumulation of water in the Urns in the Cemeteries as well as in the sagged gutters of the house drains, which are a great source of mosquito breeding after rain.

6. *Appeal for a more Skilled Medical Body to conduct the Campaign.*

Upon August the 4th, the fever still making headway in spite of all local efforts, the Advisory Board takes very decided action. It candidly expresses the opinion that it has not confidence in the efficacy of the work performed up-to-date; *that this work must be absolutely perfect in its working to be efficient*, and that to accomplish the desired re-organisation it is necessary to call in the assistance of the Public Health and Marine Hospital Service of the United States.

NEW ORLEANS,
CITY BOARD OF HEALTH. *August 4th*, 1905.

GENTLEMEN,

As there has appeared a new case in the Frye focus, which has been in existence since Monday, while we had been told that the instructions previously agreed upon in the management of all maturing foci had been rigidly carried out, and especially so in this case. As we are not satisfied that the fumigation performed by the City Board of Health has been absolutely effective, we feel, as we have shared some of the responsibility of this work, that it is a matter of too great importance to be kept on in this unorganised and unsystematic manner. This is the first serious visitation of Yellow Fever in this country since the mosquito has been recognised as the only mode of transmission, and we are unwilling to support the City Board of Health in what we consider an ineffective service.

We regard this as the first crucial test in America, and it must be absolutely perfect in its working to be efficient. We think that the community has lost confidence in this work. We know that the profession has lost faith in it. Hence, we cannot keep on upholding a system in which we do not fully concur, so we desire to strongly recommend that the system be completely reorganised, or that the entire Yellow Fever situation in New Orleans be placed in the absolute control of the United States Public Health and Marine Hospital Service.

Very respectfully yours,

(Signed) ADVISORY COMMITTEE, ORLEANS PARISH MEDICAL SOCIETY.

As the result of this letter and of a telegram despatched to the President of the United States, the Public Health and Marine Hospital Service assume, in a few days, control of the campaign. The Advisory Committee, however, continue their useful work and co-operate with the new forces under Dr. White, just as they had done with the Local Health Authorities, continuing to issue with Dr. White most useful circulars, and to generally encourage in every way the citizens to keep up the fight with unabated vigour. As the circulars which they issued show a thorough knowledge of the situation and great foresight I give them in full.

7. *Letter warning Medical Men not to overlook the Mild Type of Yellow Fever which may be found in the native born.*

ORLEANS PARISH MEDICAL SOCIETY,
NEW ORLEANS, LA.,
August 17, 1905.

DEAR DOCTOR,

In the consistent campaign we are now waging throughout the City against the fever we want to enlist your hearty assistance.

You have shown up to now a uniform activity, and if some of the work already accomplished begins to show some little improvement, we feel it is greatly due to your co-operation. This though, is the crucial moment, and you must keep up reporting all your cases with unfailing promptness. *The native born will undoubtedly begin to be affected, and will show the lightest and mildest types of the disease; it is specially with regard to these, that we wish to warn you, for it is as important to the success of the work being done by the U.S.P.H. and Marine Hospital Service, that the mild cases be reported as well as the marked cases. These must be screened as carefully as others.*

One stegomyia infected, in the first three days from such a case, can produce a number of serious and even fatal cases. The means employed are being systematized and rendered less objectionable daily by the service, so let us endure a little inconvenience for the welfare of all.

Beware of the so-called immunization or acclimatization fever and report these cases as promptly and rigidly as if they were perfectly characteristic, so that the authorities will be able to give them the same SANITARY TREATMENT.

Very earnestly yours,

ADVISORY COMMITTEE, O.P.M S.

8. *Appeal to Householders to delay "Moving Day" on account of Danger of Spreading Infection.*

In view of the near approach of "Moving Day" (October 1st) the undersigned deem it their duty to direct your attention to the danger likely to attend a general moving of tenants from house to house.

Persons moving from infected localities may later develop the fever in uninfected neighborhoods, thereby developing new foci. Others now residing in uninfected houses may contract the disease by removing into houses where mild cases of fever may have occurred and recovered without Medical Attention, and consequently escaping fumigation. Non-immunes coming into such houses will almost inevitably contract Yellow Fever, thereby adding to our present troubles.

We do therefore urge the importance of taking such steps as may be necessary to delay the general movement for at least thirty days.

ADVISORY COMMITTEE, O.P.M.S.

9. *Danger of Removal of Temporary Cistern Screens.*

NEW ORLEANS PARISH MEDICAL SOCIETY,
NEW ORLEANS, LA.
Sept. 13, 1905.

There being a pretty general understanding in the community that the cheese cloth screens over cisterns have to be removed by Oct. 1, and the regular 18-mesh to the inch wire screen substituted by that date, we believe that a number of persons are now having this change done to the great danger of a general liberation of all mosquitoes imprisoned or bred from the pupæ in the cisterns. We can not afford, in the final fight of checking Yellow Fever in our midst, to neglect so important a matter as this, so we strongly urge that the change from cheese cloth to wire, if not legally postponed until Dec. 1, shall be by having the wire screens placed over the cheese cloth without removing the latter.

ADVISORY COMMITTEE OF ORLEANS PARISH MEDICAL SOCIETY.

II.—THE CITIZENS' ORGANISATION.

It was mentioned in an earlier part of this history of the organisations that a Citizens' meeting was held on July 21st, in the Town Hall, for the purpose of raising funds, that Mr. Janvier was appointed Chairman of the the Yellow Fever Fund Committee, and that on July 24th the first step in Ward organisation was made by Ward 14. A further step was taken on July 26th when the Advisory Committee, together with the Health Authorities, decided to place the organisation of the 16 Wards of the City under the charge of one man. They selected Dr. Warner, who, by his devotion, energy and personality soon won the confidence of all classes of citizens, and made them work as one man.

The Citizens' Volunteer Ward Organisation.

On July 28th the Central Office of this splendid organisation was opened under the direct charge of Dr. Warner, and under the guidance of the Advisory Committee. Dr. Warner immediately set to work and issued a circular to all the Wards, calling upon those who had not already organised to do so, to open offices in each Ward, and asking each what it proposed to do. A meeting was also summoned of the Chairmen of each of the Ward organisations to deliberate on the best plan for co-ordinate action.

The 16 Wards took up the work with enthusiasm. Each Ward held numerous meetings and planned its line of action in the campaign against the mosquito. Each took charge of the sanitary operations of its district, commenced screening and fumigating, and purchased stocks of cheese cloth, lime, oil, oilers, pasting materials and ladders to reach to the top of the cisterns. Each one organised the necessary gangs requisite for inspecting, screening, fumigating and oiling. Each Ward also issued public notices and posters drawing attention to the necessity of fumigation, &c. Finally they commenced an educational campaign of the greatest magnitude. Under Dr. Warner's administration the organisation set to work to educate the whole population; numerous meetings were held every night in the various Wards, in the churches of all denominations, schoolrooms, halls, clubs, &c. The audiences were addressed by medical men especially chosen for their expert knowledge, by leading citizens, by the Mayor, Dr. Warner, the Bishop and numerous other citizens. The City Health Officer was especially active in giving almost every night to large audiences a lantern demonstration of the life history of the Stegomyia, throwing upon the screen by means of the lantern the "wiggle waggles" kept alive in a water cell. This was always a popular and useful demonstration and should be copied extensively. The lectures were given in English and other languages, and no section of the very mixed population of New Orleans was left out. All religious denominations co-operated with remarkable alacrity, and lent their churches and organisations to the lecturers. The coloured people were organised and many meetings were held amongst them. At first it was difficult to overcome the prejudice of the Italian and Sicilian people, but by using influence with their own priests, and leading men, they, too, became more amenable. The

campaign was thus in the hands of the Ward Organisation which received its expert advice from the Advisory Board. In the emergency it supplemented and largely replaced the City Health Board.

It was an excellent organisation and brought about an immense awakening of the people in the matter of sanitary reform. When finally the Advisory Committee, as previously mentioned, saw that the fever gained in spite of the energy of this civic organisation, owing to lack of sufficient trained and official medical officers to direct, and that it was necessary, therefore, to appeal to Washington for the Public Health and Marine Hospital Service, and when, in consequence, the Service did take charge, the latter immediately placed its own marine medical superintendents in charge of each of the Ward offices, and simply co-ordinated, drilled and extended the ward machinery; in this way it ensured perfect co-operation.

Before entering upon this final stage of the campaign, I would like to draw attention to some of the Proclamations and Notices which were issued both during the period when the Ward Organisation was in sole charge of the campaign, and subsequently when it was under the supreme authority of the Marine Hospital Service. The first two which I insert are official notices from the civic authority and are signed by the Mayor. The first one is a most useful water screening ordinance, and constituted a most powerful factor in bringing about the suppression of the disease. It is one which should be extensively copied.

1. *A Water Cistern Screening Ordinance.*

MAYORALTY OF NEW ORLEANS,
CITY HALL, *Aug.* 2, 1905.

No. 3196 NEW COUNCIL SERIES.

AN ORDINANCE, prescribing the manner in which water liable to breed mosquitoes shall be stored within the limits of the City of New Orleans.

Section 1.—Be it ordained by the Council of the City of New Orleans that no water liable to breed mosquitoes shall be stored within the limits of the City, except under the following conditions.

Section 2.—Water kept in cisterns, tanks, barrels, buckets, or other containers for a period longer than one week shall be protected from mosquitoes in the following manner. Cisterns shall be covered with oil by the property owner or agent thereof within forty-eight hours after the promulgation of this ordinance and provided with a cover of wood or metal; all openings in the top or within six feet of the top larger than one-sixteenth of an inch to be screened with netting of not less than eighteen

mesh, or cheese cloth or other suitable material by the property owner or agent thereof within forty-eight hours after the promulgation of this ordinance, provided that after the first day of October, 1905, all property owners shall be required to screen cisterns with wire netting of the proper size mesh as required by the Board of Health in such a manner as to prevent the entrance of mosquitoes.

Section 3.—Tanks or barrels or similar containers to be constructed in the manner provided for cisterns, or in some other manner satisfactory to the Board of Health.

Section 4.—Buckets containing water for longer than one week (such as fire buckets in cotton presses) and other similar containers of stagnant water, shall be covered in such a manner as to prevent the entrance of mosquitoes.

Section 5.—Water in ponds, pools, or basins, in public or private parks, places of resort or residences, or in depressions, or excavations made for any purpose, shall be stocked with mosquito-destroying fish, or covered with protective netting, or shall be drained off at least once every week, or shall be covered with coal oil in a manner satisfactory to the Board of Health, by the owner or agent thereof within forty-eight hours after the promulgation of this ordinance.

Section 6.—The Board of Health may, in its discretion whenever deemed necessary, treat stagnant water by applying oil to its surface in such a manner as to destroy mosquitoes.

Section 7.—The penalty for violations of this ordinance or any section thereof shall be a fine of not more than twenty-five dollars, or imprisonment for not more than thirty days, or both, and failure to comply with any provision shall be considered a separate offence for each day of its continuance after the proper notification by the Board of Health.

Adopted by the Council of the City of New Orleans,

August 1, 1905.

T. W. Campbell,
Clerk of the Council.

Approved Aug. 2, 1905.

Martin Behrman, Mayor.

2. *A Day Appointed to "Clean up" in the City.*

The following is an appeal to the Citizens to "clean up," and it again should be copied by all towns in the Yellow Fever zone:—

The Mayor's Proclamation.

It has come to be recognised as an indispensable necessity for the eradication of disease, and for the proper safeguarding of our public health, that our City should be thoroughly cleaned. Our patriotic citizens are unanimous in the sentiment and have generously come forward to aid and assist in such a movement.

The Executive Committee which was named to consider and take action upon the thorough cleansing of the City, recommended that Wednesday, August 9, 1905, be observed as general cleaning up day. To that end, and to promote the more expeditious handling of the accumulations of dirt, it has been recommended that all householders begin the work of cleaning their premises Monday, and continue the same Tuesday, in order that the refuse and pilings will be ready and convenient for removal Wednesday, "General Cleaning Up Day."

It has been earnestly and urgently recommended that all merchants and business men assist in this work by closing their respective establishments on that day, so that

they and their employees may assist in the task. There have been many patriotic offers of carts, wagons, teams and drays, and all contractors who are engaged in work of public improvement are urged to contribute their teams to aid in this laudable undertaking of removing trash and pilings. The details of this work will be planned and prepared under the direction and control of the Commissioner of Public Works, to whom the tender of carts, teams, &c., must be made as soon as possible in order that tne full programme may be perfected and made public not later than Tuesday morning.

In furtherance of this great object, I do hereby call upon every taxpayer and householder to extend every assistance towards the effective performance of the work, and urging that all merchants and business men close their respective establishments on that day, I do hereby proclaim Wednesday, Aug. 9, 1905, to be "General Cleaning Up Day."

Witness my hand and seal of Office, affixed this fourth day of August, A.D. 1905.

MARTIN BEHRMAN,
Mayor.

3. *Appeal to the Clergy.*

CITIZENS' VOLUNTEER WARD ORGANISATION,
NEW ORLEANS, LA., *July* 29, 1905.

TO THE REVEREND CLERGY:

The influence of the Reverend Clergy is such, and their loyalty and public spirit has been so often demonstrated, that we venture to ask your co-operation with the Citizens' Volunteer Organisations in the present emergency.

United action produces the surest results.

We beg to ask that you will speak to your congregations on Sunday, July 30th, or at the earliest date thereafter convenient to yourself in behalf of the work now being carried on by the Health Authorities of the City.

We ask that you will urge them, whether they believe in the "mosquito theory" or not, that they will give their hearty assistance to the authorities who are attempting to stamp out the mosquito, as at least one source of infection. Urge upon them the patriotic duty of allowing cisterns to be oiled and screened; cesspools to be treated with disinfectants, &c.

Many householders (a small minority but still enough to work mischief) refuse permission to the oilers and screeners to do the work. This refusal nullifies to a great extent the work accomplished on the premises of willing householders. In previous visitations of the fever we have been fighting in the dark, striking at an unknown enemy coming from a mysterious source.

The consensus of scientific opinion fixes upon the mosquito as the agent of transmission of the Yellow Fever.

The enemy therefore is in sight. So far as your power extends then, we beg of you to use it for the spread of information concerning the mosquito theory, and to use your influence with your congregations to hold up the hands of the constituted Health Authorities.

This office will gladly receive suggestions and will give all possible assistance to the Ward Organisations.

It is proposed to have two cleaning up days, by proclamation of the Mayor, although this has not at this writing been definitely decided.

The daily newspapers will announce it when determined. We will ask you to bring this matter also to the attention of your congregation.

Faithfully yours,

BEVERLEY WARNER,
General Superintendent.

4. *Charity Organisation during the Epidemic.*

The Charity Organisation Society has been designated by the General Superintendent of the Citizens' Volunteer Ward Organisation to receive and disburse such money and supplies as shall be contributed for the relief of the sick and poor people whose sufferings may be due to the present visitation of Yellow Fever.

The Society is fully organized, with permanent headquarters, perfected machinery, competent investigators, and an intimate knowledge of the poor of this City.

We appeal to all good citizens for money for the "Emergency Fever Fund," pledging ourselves that every dollar so contributed will be sacredly devoted to the help of those to whom the Yellow Fever, and its accompanying hardships, have brought suffering.

We have no funds in hand except twenty-five dollars received from Mrs. Christian Keener. Receipts will be published from time to time.

MICHAEL HEYMAN,
President of the Charity Organisation Society.

I beg to endorse this appeal most heartily, and to ask our citizens to make the above Society the channel of their contributions to the fund for general work of relief which we may be called upon to undertake.

While we do not seek to interfere with the charitable work of the churches and benevolent organisations, but to co-operate with them, we wish to sound a note of warning in time. Emergencies like the present are rich opportunities for the charity "grafters." The misfortunes of the sick and poor are made the capital of the lazy and worthless.

The Charity Organisation is better equipped than any other I know in New Orleans to deal with this important side of the volunteer work, and this office heartily endorses the above appeal.

BEVERLEY WARNER,
General Superintendent.

Ward Notices.

The following notices, from one of the Ward Offices and distributed to Householders in the Ward serve as examples of the useful work which they did.

Request to the Householders of the Ward to observe a General Fumigation Day.

FIRST WARD CITIZENS' SANITARY ASSOCIATION,
1749, ST. CHARLES AVENUE,
NEW ORLEANS, LA., *September* 1, 1905.

TO THE CITIZENS OF THE FIRST WARD.

Saturday, Sept. 2, and Sunday, Sept. 3, have been suggested and agreed upon as GENERAL FUMIGATION DAYS, between the hours of 10 a.m. and 12 a.m., for the purpose of destroying the mosquitoes, which are recognised as the medium of communication of Yellow Fever, and we make the following suggestions as to the manner of fumigating :—

1. Close all outside openings, such as doors and windows, and make the house (or room) to be fumigated as tight as possible, by closing or stopping the fireplace and other openings, with paper pasted over them.
2. Pianos should be removed from the rooms to be fumigated.

3. Place an iron vessel, flat skillet preferred, in pan or tub with about one inch of water in it; place roll of sulphur or flower of sulphur (two pounds to each ordinary sized room to be fumigated) in the skillet; pour over it a small quantity of alcohol, about two tablespoonsful to the pound, and set fire to same.
4. Keep the house, or rooms, closed for two hours after lighting the sulphur.

Those who prefer to do so may use Pyrethrum powder (insect powder) instead of sulphur. Where this is used the rooms should be swept after the fumigation and the mosquitoes so gathered up should be burned, as Pyrethrum powder merely stuns the mosquito. The amount of Pyrethrum to be used is one pound to each ordinary sized room.

We quote the following from Rev. Beverley Warner, Superintendent:—

"In conformity with the urgent request of the Marine Hospital Surgeon in command, and on behalf of the Volunteer Ward Organisations, your representatives, I earnestly recommend a general fumigation of the houses, stores, office buildings, factories and every harboring place of the mosquito, on Saturday, September 2, and on Sunday, September 3, in the case of those who find that a more convenient day.

"Respectfully,
"BEVERLEY WARNER,
"General Superintendent."

Residents of the First Ward can procure sulphur for fumigation free by applying at any of the places named on the back hereof. The citizens of the First Ward have, up to now, manifested their intelligence by solidly supporting the authorities, both our own local health officers and those of Marine Hospital Service since they have taken charge, by implicitly following their directions and suggestions in the fight that has been, and is being made, against Yellow Fever and its disseminator, the mosquito. The good resulting therefrom is shown in the diminution of the number of new cases since the fumigation of last week and the week before, although they were not as general as they should have been. The good results from the sanitary work done in the First Ward by its people, and their general compliance with the recommendations of the Health Authorities is demonstrated by the comparatively small number of cases of the fever which have appeared in our ward.

We strongly urge you to fumigate on Saturday, or Sunday, in compliance with the above request, and thus assist in stamping out the fever and ridding our City of the mosquito which transmits it.

Respectfully,
C. TAYLOR GUACHE,
President of the First Ward Citizens' Sanitary Association.
W. J. BRADY,
Secretary.

SULPHUR DEPÔTS.

Boebinger's Grocery	St. James and Tchoupitoulas.
Neupert's Grocery	Tchoupitoulas and Orange.
Manning's Grocery	Tchoupitoulas and Theresa.
Twohig's Grocery	Market and Chippewa.
Huber's Grocery	St. James and St. Thomas.
McLaughlin's Grocery	Felicity and St. James.
Corbett's Grocery	Orange and Constance.
Holmes' Grocery	Terpsichore and Constance.
Holmes' Grocery	Camp and Melpomene.
Abradie's Grocery	Prytania and Euterpe.

Moore's Grocery	St. Thomas and Race.
Moore's Grocery	Race and Religious.
Feahney's Grocery	Melpomene and Constance.
Burn's Grocery	Felicity and Religious.
Labruyere's Grocery	Race and Constance.
Altmeyer's Grocery	Annunciation and Robin.
Heimel's Grocery	Baronne and Melpomene.
Heimel's Grocery	Rampart and Melpomene.
Decourcey's Grocery	Thalia and Baronne.
King's Grocery	Dryades and Thalia.
Lacey's Grocery	Robertson and Melpomene.
Bornsel's Grocery	Melpomene and Howard.
Erlinger's Grocery	Thalia and Liberty.
Corondona's Grocery	Mongolia and Melpomene.
Geary's Grocery	Melpomene and Howard.
Wilson's Grocery	Liberty and Felicity.
Carroll's Grocery	Claiborne and Melpomene.
Dowie's Grocery	Terpsichore and Saratoga.
Second Precinct Police Station	Chippewa and Terpsichore.
Ward Headquarters	1749, St. Charles Avenue.

SCREENS.

IMPORTANT. READ CAREFULLY.

TO THE RESIDENTS OF THE 12TH WARD.

The good work of all residents in the 12th Ward has called for much attention by the press and public. All cisterns have been oiled and screened, gutters oiled several times, and many of the houses fumigated, but we must not rest or stop one minute.

We must kill every mosquito that breeds Yellow Fever, and hasten the end of the fever by stamping out every spot in the ward where mosquitoes can breed.

We must continue to oil the gutters whenever necessary. The cheese cloth around the cisterns are being torn and broken daily by the wind, and providing places in which the mosquito will breed, and it should be corrected at once. In order to help the good work and stop this means of breeding mosquitoes,

YOU ARE REQUESTED AND URGED TO COVER YOUR CISTERN WITH NOT LESS THAN 18 MESH WIRE AT ONCE, AND WITHOUT FURTHER DELAY.

There is ample wire now here to do this, and a few dollars spent now to correct the bad screening will make the work permanent and save many lives.

ALL CISTERNS MUST BE SCREENED WITH WIRE BEFORE OCTOBER 1ST.
THAT IS THE LAW.

Don't get the wrong wire, if you do it will have to be done over again, and in order to show you what 18 mesh wire is we call your attention to this picture showing the size, 18 holes to the inch.

Don't wait until October 1st, and perhaps have an affidavit made against you, followed by a fine, and perhaps imprisonment: while you have time.

DO IT NOW. THE SOONER, THE BETTER FOR ALL.
12TH WARD SANITARY ORGANISATION.

III.—The Public Health and Marine Hospital Service Organisation.

On August the 4th, at a meeting at which the Mayor, the President of the Orleans Parish Medical Society, and the representatives of all commercial bodies in the City were present, it was decided to ask the United States Government to take control of the Yellow Fever situation. Accordingly messages were immediately transmitted by the Governor of Louisiana and the Mayor of New Orleans, to the President of the United States, asking the Federal Government to assume control of the health situation and pledging the hearty co-operation of the State and City Government, the State and City Health Boards, the Parish Medical Society, and of the merchants and people generally. The request was gladly complied with and Dr. White, who represented the Public Health and Marine Hospital Service, and who had, from the commencement of the outbreak, been watching and co-operating with the local organisations on behalf of the Federal Government, took complete charge from August 7th, and in the course of a few days, having collected a staff of twenty trained Marine Hospital Service Surgeons, promptly set to work to strengthen the organisations and increase the stringency of the Anti-Yellow Fever measures.

Functions of the United States Public Health and Marine Hospital Service.

In view of the great services which this body rendered the cause of public health in 1905, a few remarks upon its history and function are not without interest at this stage. The Service was constituted in 1798 for the purpose of the care of disabled sailors at ports in the United States. In 1875 under the able guidance of Surgeon-General Woodworth, the Marine Hospital Service expanded its functions and took an active share in quarantine and local health administration. Shortly afterwards the Service became the authority upon quarantine administration, and the services which it rendered to commerce on account of its wise reforms began to be widely appreciated. In 1878 it organised the first medical expedition to gather information upon Yellow Fever, and thus set an example which has been a feature of this useful service. In the same year national quarantine was established, and the Marine Hospital Service

was appointed to frame regulations and to supervise. Simultaneously Consuls in Foreign Ports were instructed to report to the Surgeon-General the existence of contagious diseases. The Service was also empowered to publish weekly bulletins upon health and to transmit them to their officers and to other public health bodies. After this date the expansion of the public health duties of the Service rapidly increased. The Surgeon-General instituted an inspection of all State and Local Quarantine Boards requiring them to conform to the law, whilst under the Immigration Acts all incoming aliens had to be examined by the Marine Hospital Service Officers for physical soundness. At a number of ports the carrying out of quarantine was handed over by the State to the Central Machinery of the Federal Government. In certain instances, however, the national Government through its Public Health Service assumed charge because of the non-compliance of the local authorities with the law.

A number of States still conduct their own quarantine, and whilst the Federal Government takes care that the quarantine law is strictly administered it has no right to prevent a state or local authority adding additional and often onerous quarantine measures to the minimum standard which the Federal Government regard as efficient. This has, in the case of New Orleans, been brought prominently forward in 1905, and the opinion has been freely expressed that in the interests of safety and commerce there should be exclusive national control. The present dual system is complex, and moreover, as the local authority exacts fees, whilst the Federal Government does not, commerce would gain. A great feature of the Marine Hospital Service is the Staff of Surgeons, who are stationed at various foreign ports with which the United States is in trade relationship, and also the number of surgeons who are available for sending to places, like New Orleans, when an emergency arises. In their very varied professional duties both abroad and in the United States, the Surgeons of the Marine Hospital Service gain a very considerable experience not only in treating infectious diseases such as Yellow Fever and plague, but also in dealing with men of all nationalities and in hunting out disease. They wear a military uniform, and the business-like and determined way in which they set about their appointed work unquestionably inspires confidence. This

was certainly the universal opinion in New Orleans during the epidemic. Another feature of the Marine Hospital Service is the encouragement which is given to research. At the headquarters of the Service in Washington there is a Bureau of Hygiene in the Laboratories of which investigations are continually taking place in infective processes, preventive medicine, parasitology, pharmacology and bio-chemistry. From time to time also expeditions are sent abroad to study tropical diseases such, for instance, as Yellow Fever. The representatives of the Marine Hospital Service stationed in foreign towns, notably in the important fruit ports in Central America and in the West Indies, have very important duties assigned to them. They keep the Central Government at Washington informed of the Health conditions of not only the ports in which they are stationed, but of the surrounding country in addition. Thus they are the first to cable to Washington the outbreak of quarantinable diseases. They also exercise a very beneficial effect in the ports in which they are stationed, and their services are often made use of by the local authorities. Thus during the epidemic of Yellow Fever last year in many of the Fruit Ports in Central America they took the lead in organising anti-stegomyia measures.

From the foregoing remarks it is clear that the title "Marine Hospital Service" does not indicate the wide functions of this body, and, indeed, in 1902 the Service was confirmed by Law as a National Public Health Service of the United States, and it was enacted that in future it should be known as the Public Health and Marine Hospital Service.

Description and Progress of the Campaign under the New Organisation.

With great tact Dr. White took over the local Ward organisations, which, as we have seen, had already accomplished a great deal, and were in fair working order. He placed at the head of each Ward a Marine Hospital Surgeon. In the originally infected quarter he formed a special Depôt in charge of Surgeon Berry, and together with Surgeons Richardson and Lazard as his assistants, he established his own headquarters in the centre of the City. The plan of campaign was that which had already been adopted by the Ward

organisations, only now it was carried out with renewed energy and precision. It consisted in:—

1. Discovering every case of Yellow Fever and isolating it.
2. Killing all Stegomyias.
3. General warfare against all mosquitoes, except swamp.
4. Ensuring that each Ward was fully equipped with its forces of inspectors, oilers, screeners, fumigators and others as wanted, and that there was an adequate number of men.

Each Ward Office was in telephonic communication with the Central Office.

Under the Marine Hospital Surgeon in each Ward were placed one or more medical assistants, young local medical men, chosen on account of their local knowledge and ability, and a staff of workmen, varying from 28 to 128.

Each Ward Centre was furnished with a supply of—

Fumigating Materials—Sulphur, pyrethrum, pots for fumigating, paper, paste, laths and all accessories for sealing.

Screening Materials— Bobinette and sheeting, wire, portable wire screened doors, ladders, nails, hammers and all accessories.

Oiling Materials— Oil and oil cans, ladders, scythes for cutting rank grass, carts.

A map of the district was kept in each Office and the progress of the cases, the number of cisterns oiled, and of houses fumigated were recorded with dates. The various gangs, whether inspectors, oilers, screeners or fumigators, left the Ward Offices early in the morning for their appointed tasks, or at such time as they were particularly required. A practitioner might report a case to the Central Office or directly to the Ward Office in which the case occurred. If in the former manner the Central Office telephoned to the Ward Officer concerned. As the result of the call, a screening and fumigating gang (fig. 6) would be despatched, the patient's room would be screened and the rest of the house fumigated, or the patient would be removed in the ambulance (fig. 5) to the Emergency Hospital, and the house fumigated. Depending upon circumstances the surrounding blocks would also be fumigated, and from the tenth to the thirtieth

FIG. 5. The Screened Emergency Hospital Ambulance, New Orleans.

FIG. 6. A Screening Gang about to start to screen a room containing a yellow fever patient, New Orleans.

(From Report on Yellow Fever, British Honduras, 1905.)

day of the occurrence of the case the Medical Inspector would visit the house every day to locate any secondary cases.

The work of the Central Office consisted in directing the work of the Wards, receiving reports of cases, preparing and issuing reports and instructions, and in generally organising. For these purposes a large clerical staff, as well as a statistical department and accountants' office, were necessary. All cases of fever had to be notified to this Office, and it was in constant receipt of innumerable complaints and questions. Every morning either Dr. White or Dr. Richardson made an inspection tour of the districts. It was soon found necessary in order to check unnecessary expenditure to establish a *purveyor's office*. This was placed in the charge of Dr. Perkins and a staff of about twelve assistants. Each Ward was required to send in a requisition to this department for the material it wanted, which, if not in stock, was promptly obtained. In this way waste was avoided, and by purchasing supplies beforehand in the cheapest markets, considerable saving was effected. The office was most carefully organised and everything was reduced to a very precise system.

Total Number Employed in the Campaign.

Total number of men, inspectors, oilers, screeners &c....	910
Special Fumigating Division	156
Special Investigating Division	105
Purveyor's Department	32
	1,203

The total Medical Staff was fifty, of which twenty were Marine Hospital Service Surgeons.

Boards of Consulting Experts.

A body of twenty-three experienced medical men were chosen amongst the various wards, who were available at any time for consultation upon difficult or suspicious cases.

During the first few days after the Marine Hospital Service was officially placed in charge of the campaign, Dr. White was busy meeting the Presidents of the Ward organisations, placing his own

officers in charge of the Wards, instructing them in their duties, and holding daily conferences with the various representative bodies.*

On August 11th he met the Presidents of the Ward Organisations and agreed upon the following general plans:—

That the work of the Ward Organisation must be carried on as strenuously in the future as in the past.

That there should be a "mosquito killing day" throughout the City once a week, when the entire population should make an effort to kill by fumigation the mosquitoes in their houses.

That all the street gutters should be flushed out once a week.

That every Ward undertake a complete minute inspection of all cisterns in its territory to see that they are perfectly screened.

That as an extra precaution the oilings of all cisterns be continued.

That only oil of at least 150 flash test be used so as not to render water unpleasant.

That all physicians and everyone else in the City report to headquarters every suspicious case they might learn of.

A feature which struck me as one well worthy of particular note was the degree of freedom of action which he allowed to his officers, and the trust which he placed in their intelligence, commonsense, energy and loyalty. I can certainly say from my close observation of this confidence in his juniors that it worked admirably, the sense of freedom which the younger officers possessed, in my opinion, contributed to their feeling the responsibility thrown upon them, and to their taking an intense personal interest in the progress of affairs in their Wards. There existed a complete sense of brotherhood between seniors and juniors, and all felt it to be their paramount duty to make a success of the campaign. In spite of the fact of the intensely hot and close days of August, and that their chief work

* For example, on August the 8th, at a meeting convened at the residence of Bishop Sassums, of the representative Laity, Clergy and Medical Men, he gave the following practical hints, viz.:— That during the epidemic the ladies should not visit unnecessarily. That they should not go out unless business called them. That they should not leave home unless for Church or for actual necessary shopping. That they should not wear low quarter shoes. That they should not go into their neighbours' homes unnecessarily. That they should not go out without a veil, and that they should not go out without gloves as both were a protection against Stegomyia.

He also exhorted the medical men present to report all cases of fever. "If you have a case of fever and it is a bit questionable, set aside all your professional pride and call in an expert to see if it is not a mild case of Yellow Fever. *A little child may have a light fever for twelve hours, pass off, and the family physician say it was nothing.* That child may be bitten by mosquitoes, and in about twelve or fifteen days the whole family may be taken down with violent cases of Yellow Fever. That is why I appeal to the family physicians to help us. One mild case that you are not inclined to call Yellow Fever, or not report, may be responsible for 100 cases."

was in the slums, they worked with untiring energy and set a most stimulating example to all classes of citizens. The ultimate success of the campaign is due to their skilful handling of the operations, and is the best demonstration of the importance of employing energetic, young and thoroughly well-trained medical men to combat epidemics. If England proceeded in the same determined way to attack Malaria, which is still the great cause of sickness and mortality in her tropical possessions, the disease could be got under and a complete change brought about in the conditions of life in the Tropics, a change, moreover, which would completely alter most of the present conditions of commerce.

Every day of the campaign increased the experience of the Ward officers, and the organisation became more and more perfect. They had to feel their way in the commencement, but later their operations were directed with the greatest precision, leading, as we shall see, to the limitation of the fever in October, practically after two months strenuous work.

I will now insert some of the circular notices which were issued to the ward officers and others, as they are eminently practical, and a good guide for future operations of a similar kind.

1. *Formation of Inspecting, Oiling, Salting and Screening Squads.*

This is a circular letter issued from the Central Office on August 16th, by Dr. White, and embodying a letter of recommendations drawn up by Dr. Metz. It reads as follows:—

PUBLIC HEALTH AND MARINE HOSPITAL SERVICE.
OFFICE OF MEDICAL OFFICER IN COMMAND,
NEW ORLEANS, *Aug. 16th*, 1905.

SIR,

There should be attached to the officer in charge of the Ward, as many inspection squads as will be necessary to cover the territory in his charge as quickly as possible; after the ward has been fully inspected there will be need of one or more squads to re-inspect the district at certain intervals. These inspectors will fill out the report blank which will be furnished them. They will also issue notices to owner, agent or occupant to clean premises, empty privy vaults, order the screening or re-screening of cisterns should the same be required.

The foreman of each squad should be a special officer, commissioned by the Mayor, in order to enforce compliance with the order issued in the name of the Board of Health of the City of New Orleans, and the U.S. Public Health and Marine Hospital Service, and these men sworn into the service.

There should also be attached to the officer in charge of a ward, one or more oiling

and salting gangs to see that all empty lots holding stagnant water, should be salted, and all gutters which are stagnant should be thoroughly salted.

In order that there shall be no conflict between the Citizens' Volunteer Ward Organisations and the U.S.P.H. and M.H.S., I would suggest that the following shall be the basis of this understanding.

The Volunteer Ward Organisations shall have such squads as may be attached to the headquarters of such ward organisations by the Central Headquarters of the Citizens' Volunteer Ward Organisation. These squads will receive their instructions from the U.S.P.H. and M.H.S. Officers in charge of said ward, report to him the specific work done, and the premises at which the work was done.

The report shall be made in duplicate, one copy for the U.S.P.H. and M.H.S. and the other for the Central Headquarters of the Citizens' Volunteer Ward Organisation.

UNIT.

For Labour and Material needed for one Screening Inspection Squad.

1 Foreman.
2 Labourers.
Wagon.
2 ladders (extension).
3 hammers.
2 carpenters' aprons.
5 pounds of tacks.
1000 yards of cotton cloth, preferably sheeting.
2 pairs of shears.
1 gallon oil can.
3 sacking needles.
2 balls of twine.
Scratch pads.

The above is fully approved, and all Officers in Division Command will please take note of this matter, will select the number of men necessary for their work, after consultation with Dr. Metz, and they and Dr. Metz together will select the foreman. Each foreman will be ordered to report to the Mayor's office, at a time designated by Dr. Metz, to be sworn in. Dr. Metz will then do everything in his power to aid in the perfection of this plan, the details of which he will explain to any officer who does not understand the idea.

Respectfully,

J. H. WHITE,
Surgeon, P.H. and M.H.S.

2. *Necessity of Hourly Reports from the Wards to Headquarters.*

PUBLIC HEALTH AND MARINE HOSPITAL SERVICE.

NEW ORLEANS, *August 17th*, 1905.

GEN. ORDERS.

1. Officers in charge of wards are directed to communicate each hour with the Central Headquarters, for the purpose of securing reports of cases in their respective wards, so that immediate action may be taken in the way of screening and fumigating.

2. The daily lists of all reported cases will be mailed from these Headquarters to each ward, as heretofore.

J. H. WHITE.

3. *Directions for Pyrethrum Fumigation.*

PUBLIC HEALTH AND MARINE HOSPITAL SERVICE.

NEW ORLEANS, *August 18th*, 1905.

GENERAL ORDERS.

1. Officers in charge of fumigation are directed to use pyrethrum powder, in the proportion of 2 lbs. to 1,000 cubic feet in the preliminary fumigation of houses in which patients are actually sick at the time the fumigation is done.

2. In using pyrethrum, great care in pasting on the inside of the room all cracks and crevices is necessary, and all save one exit should be pasted before lighting the pyrethrum.

3. After pyrethrum fumigation, it is necessary to sweep and dust the various rooms fumigated with care, burning at once all sweepings.

4. The object of this fumigation is to reach, at the earliest possible moment, all mosquitoes which may have bitten the patient, and without irritation to patient and relatives.

5. Pyrethrum packed in 5 lb. packages can be secured from the Purchasing Agency.

J. H. WHITE.

4. *Upon the Imperative necessity of Reporting Suspicious Cases.*

This is a very important circular letter which was issued to the Medical Profession of New Orleans urging the importance of reporting all fevers where the diagnosis is not clear.

PUBLIC HEALTH AND MARINE HOSPITAL SERVICE.

NEW ORLEANS, *August*, 1905.

DEAR DOCTOR,

Considering the imperative necessity of instituting at the earliest possible moment prophylactic measures in the case of any person, suffering of a fever which may subsequently be shown to be Yellow Fever, you are urgently requested to report to this office not only any case of fever which you may be sure is Yellow Fever, but also ANY CASE YOU MAY BE UNABLE, even at your first visit, to say is not Yellow Fever.

We enclose you cards which will facilitate your report of such cases, and will at the same time give us your authorization to inspect the said premises and to do whatever may be necessary to prevent the extension of the infection in the house or neighbourhood.

We give you our assurance that your rights as the attending physician will be fully respected, and that our inspectors will make no attempt to examine the patient or in any manner endeavor to influence your diagnosis or treatment of the case.

We shall await your final determination of the case, but hold ourselves ready to serve you with a consultation free of charge to your patient from the enclosed list of gentlemen, who have consented at our request to aid this office in the clearing up of any doubtful diagnosis.

Feeling sure you will understand the spirit which prompts this communication—the desire simply to get the co-operation of the entire profession of this City in the checking of the multiplication of the new foci of infection and the early destruction of those already existing,

I am, very truly yours,

J. H. WHITE.

5. *The Institution of a Systematic Sanitary Survey of each Ward ordered.*

MEDICAL OFFICER IN CHARGE OF WARD.

NEW ORLEANS, *Aug.* 21, 1905.

SIR,

It is the purpose of this office to have a sanitary survey of each ward.

To carry this scheme into effect, it is necessary for you to inspect the ward under your control, with the least possible delay. It is not the intention of this office to interfere with your organisation, but to give you the necessary aid to carry the work to its rapid completion. You may, however, have to detach some men from some of your squads temporarily, until the inspection is completed. As soon as the sanitary survey in your ward is completed you will reduce the number of men to the minimum required by you to carry on the duties which have been assigned to you.

For example, in ward organisation consisting of, say, eight gangs of one foreman and two men each, might be just right, or it might need to be supplemented by four or more additional gangs. A ward with eight gangs of eight men each could be reduced to an average or uniform basis by making, say, sixteen gangs of four men each, it being my idea to reduce the inspection gangs to one foreman and two men each, and have as many gangs as necessity demands.

You are requested to make all necessary arrangements, in order that the work of inspection can be inaugurated by Wednesday morning, to this end you will engage the necessary labor. If you have intelligent men who can act as foremen in your service and in whom you have confidence, send their names at once to this office and instruct those men to report at the office of the Mayor on Tuesday morning at 10 a.m. (Aug. 22, 1905) for the purpose of swearing them into service as Special Officers. Should you desire more men as foremen this office can furnish those required.

When these foremen are no longer needed to perform the duties of Inspectors, you will ask them to surrender their Commissions and badges, and you will return them to this office, that they may be delivered to the Mayor.

The pay of a foreman will be $2.00, and the pay of the laborer will be $1.50 per day of hours.

The duties of the foreman of an inspection gang (and in which you are ordered to instruct them) will be :—

(1) To make an accurate report of all conditions as specified in the Blank Forms furnished ; and of all work done.

(2) The foreman will be required to serve notices on the tenant when the cistern is insufficiently screened, and to report to the medical officer in charge the names of all parties having unscreened cisterns ; to notify tenants that filled privy vaults shall be emptied within 48 hours under penalty of the law.

(3) The work to be done by the inspection gang shall be to repair slight defects in the cistern screening ; to empty all receptacles containing stagnant water unless protected. To oil wells that are not protected, and pits or privy vaults which can not be emptied.

(4) Material necessary for the repairs of cistern screens, as enumerated in Circular Letter of Aug. 16th, can be had upon requisition through the proper bureau.

Respectfully,

J. H. WHITE.

6. *No Divided Authority in New Orleans.*

PUBLIC HEALTH AND MARINE HOSPITAL SERVICE.

NEW ORLEANS, *August* 22, 1905.

TO OFFICERS IN CHARGE OF WARDS.

As there seems to be some misapprehension on the part of the Officers in charge of the various Wards, relative to their duties and responsibilities in the matter of the sanitary survey of the City which is to be undertaken (concerning which Circular Letter dated Aug. 21st was addressed to them), all Officers are informed that they are in full charge of all measures in their several Wards; that there is no division of authority, and that the work contemplated in the Circular Letter above referred to will be under their sole supervision, and will be conducted along with, and in addition to, their other duties.

J. H. WHITE.

7. *Beware of False Remedies.*

Comment upon the following is unnecessary.

PUBLIC HEALTH AND MARINE HOSPITAL SERVICE.

NEW ORLEANS, *August* 22, 1905.

TO THE PRESS OF THE CITY OF NEW ORLEANS.

While under ordinary circumstances I would not pay any attention at all to the claims of Dr. R. B. L., I feel that under present conditions when every effort is being directed towards the eradication of Yellow Fever in the City, along rational lines, and when the hearty co-operation of all citizens is necessary to the success of this effort, it is inadvisable to allow the attention of the people to be drawn away from proper methods and devoted to the discussion of fads, and, in order to demonstrate that this claim is not based on proper scientific efforts I submit the following facts :—

In February, 1898, this same man submitted to Congress a memorial in which he claimed, by this same arsenization method, to render persons immune, not only to Yellow Fever but to cholera and bubonic plague. This memorial was submitted to the then Surgeon-General of the U.S. Army, George M. Sternberg, one of the foremost medical men in the world, and by him pronounced to be without rational basis, and an adverse report was rendered by the Committee on Public Health and National Quarantine in the United States Senate.

The second statement I wish to make is that no remedy could be a sovereign specific for three several diseases differing from one another so tremendously as plague, cholera and Yellow Fever. It is manifestly a fact that so-called "cure-alls" cure nothing.

Finally, there are in this City several undoubted cases of Yellow Fever in the practice of physicians of high repute, and one in the Emergency Hospital itself, in all of which cases the patient had been subjecting himself to arsenization in accordance with the Leach method. This statement can be easily substantiated whenever it becomes necessary.

Respectfully,
J. H. WHITE.

We, the Advisory Committee of the Orleans Parish Medical Society, concur in the above opinion.

8. *Salting of Stagnant Gutters and Pools ordered.*

This order was issued on August 23rd, for the purpose of killing any Stegomyia which might possibly be breeding in the gutters. Subsequent experience, however, I think demonstrated that this material although efficacious against the Stegomyia was not strong enough to prevent the breeding of the Salt Marsh mosquitoes which became troublesome. Crude oils were more efficacious if used in sufficient quantity.

U.S. PUBLIC HEALTH AND M.H.S.

NEW ORLEANS, *Aug.* 23, 1905.

SIR,

A car of rock salt will be placed at , for distribution in the stagnant gutters and pools in your Ward. The wagons and labourers necessary for distribution of this salt are employed by contract from the Central Office. As soon as possible the distributing forces will report to you for directions as to the manner and place of distributing the salt, this being under your direction.

You will please institute at once a rapid survey of the streets of your Ward, so that you may have a definite idea where to place the salt, and will detail one of your foremen to supervise the distribution.

It is calculated that the average gutter 1 foot wide and containing approximately 4 to 6 inches of water will require 500 lbs. of salt. To the front of a Block, the salt should be placed only in those gutters and pools that are stagnant, and which cannot be flushed out.

J. H. WHITE.

9. *Instructions for Fumigation for Foremen of Gangs.* (*figs.* 7-9).

These most practical and eminently characteristic directions were issued by Dr. White on August 29th, that is after gaining considerable experience in this most difficult of all the Anti-Yellow Fever measures to carry out efficiently.

1. Assemble gangs in morning, note vacancies, if any, and ask for necessary men to keep gangs up to full strength.

One man in each gang must be able to speak Italian.

2. Foremen must supervise the collection of supplies before starting out in the morning. Supplies taken out must be counted, and will be checked up against them.

The following supplies are necessary :—Sulphur, alcohol, pyrethrum, flour or paste, paste brushes, tacks and hammers, scissors, oil can, roll paper, large and small sizes, cotton batting, and pots and pans.

Especial care must be used in selecting pans ; a leaky pan may cause much damage to carpets, matting or floor.

3. Assignment of houses for fumigation must be carried out in the sequence in which they are given to the foremen, unless for good reason.

The foremen are responsible for discipline in their gangs. Drinking during working hours, idling and loafing are sufficient causes for instant dismissal.

4. On arriving at a house for fumigation, the foreman is to act as spokesman, and must not allow members of his gang to " butt " in. The interpreter to be used freely in order that there may be no misunderstanding. No promises must be given that

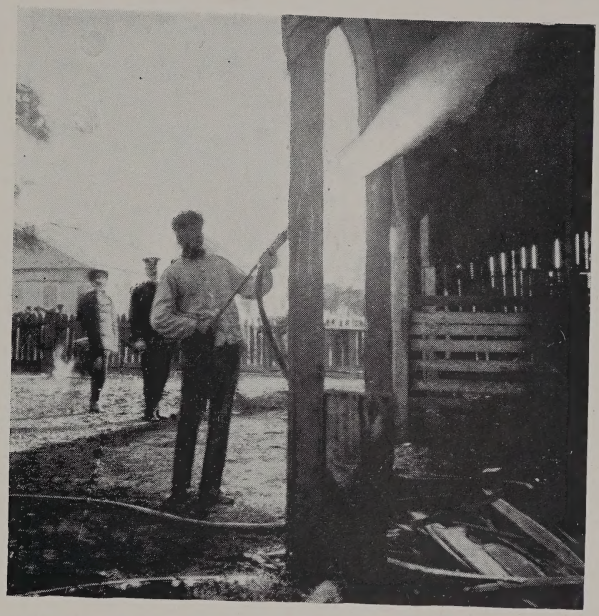


FIG. 7. Steam Fumigating, New Orleans.

FIG. 8. Fumigating Gang at work, New Orleans.
(From Report on Yellow Fever, British Honduras, 1905).

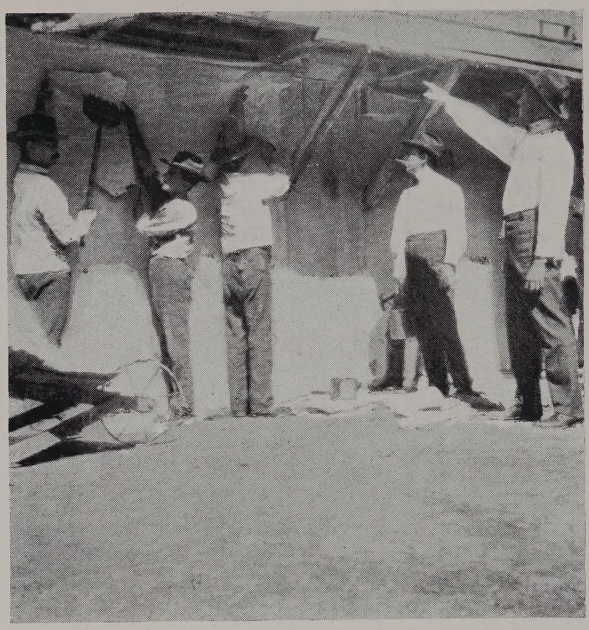


FIG. 9. Papering Archways, New Orleans.

FIG. 10. The Oiling Gang, New Orleans.
(*From Report on Yellow Fever, British Honduras, 1905*).

only one fumigation of the house will be required. It may be necessary to fumigate a house several times, depending upon the amount of infection in the neighbourhood.

5. If permission to fumigate is not secured, ascertain reason. If because of sickness, endeavor to get permission to fumigate such part or parts of the house as will not disturb the sick. This is difficult, and sometimes impossible in a small cottage, but can be easily done in a large three-story house, for instance. In this case the rear or front of the house can be done, and if the patient is not critically ill, the other floors of the house can be done. Insistence is not urged in any case, if the patient is critically ill or actually moribund. If the patient has died or recovered, no excuse must be taken for not fumigating the whole house at the same time. In case of such refusal, or other refusals where there are no sick at the house, such refusal is to be immediately reported to the Ward Office by telephone or messenger.

6. Where premises to be fumigated are entered by the foreman and his gang, he is to direct one man to examine all receptacles containing water, and oil them if they contain wrigglers.

7. The foreman himself will go through the house with the householder, and instruct that individual to remove clocks, sewing machines. freshly gilded picture frames, mirrors, candle sticks and like metallic bric-a-brac. Rooms in which there are pianos must be fumigated with pyrethrum.

Stores of tobacco, soap, flour, maccaroni, &c., are almost certain to be damaged, and should be removed before fumigation.

After overseeing the removal of articles likely to be injured, the foreman will direct the actual fumigation.

Two pounds of sulphur are to be burned to the thousand feet. Thus, a room 10 by 10 by 10 will require 2 lbs. A room 15 by 20 by 12 contains 3,600 cubic feet, and would require about 7 lbs. of sulphur. The length and breadth are to be obtained by stepping off. A long step of the average man is about three feet, and is near enough for practical purposes. The height of the room must be estimated by the eye. Ceilings range in height from 8 to 20 feet.

In order to estimate the quantity of sulphur used, the iron pot is to be weighed empty, and when three-fourths full of sulphur, the difference is the amount of sulphur to be used in a pot of that size.

8. All openings into rooms must be closed. Open flues or those not tightly closed, must be pasted over. Fire places must be filled up with old gunny sacks, and if not tightly closed by these means, must be pasted over. Crevices of doors or windows are to be closed by strips of paper pasted over them, as well as the key hole. This pasting is to be done from the inside of the room, the door for exit and egress to be left for the last, and is to be sealed from the outside. Where several rooms open into each other, it is not necessary to paste up the partition doors, which are to be left open and the rooms fumigated together.

Where door and window panels are of fine wood and close tightly, pasting may be omitted. Foreman must supervise the pasting, and see that the paste is not unnecessarily daubed on, or spilt on the floor. In using the paste, the brush is to be run across the crevices and the roll paper rapidly stuck on, an additional sweep of the brush over the paper is to be made, if the paper shows signs of sagging or falling off.

9. While pasting up of room is being completed, the sulphur pots are to be filled and set squarely in the centre of pans containing about an inch of water. The pans are to be set in centre of rooms, where there will be no danger of curtains or other drapery falling thereon, and thus starting a fire. The householder is advised to make a last search for family pets, which often display a tendency to slip into the room.

The wardrobes and clothes closets are then to be opened. This is very important, and must never be neglected, because such receptacles are favourite hiding places for mosquitoes during the day time.

About one inch of alcohol is then put into the centre of the pot and the match applied, the door of exit to be closed and pasted from the outside.

10. In fumigating a house, the privy is not to be neglected ; it can be easily closed up by using paper freely. This is not done because of the sanitary conditions or odours of the closet, but because it is an enclosed space in which mosquitoes do and may take refuge. Likewise, if the stable or chicken house can be enclosed without too much labour, they are to be pasted and fumigated.

11. Pyrethrum powder is to be burned in parts of the house where sulphur would disturb the sick, or where there are pianos or other costly furniture. The room is to be similarly prepared in pasting up crevices, &c., with this difference, that the blinds of all windows but one are to be closed up, and on the floor in front of this window, which is to be left light, a white sheet is to be spread. When the smoke begins to get dense in the room, all insects will fly towards the light, and will hover about this window until they fall stupefied on the sheet.

In using pyrethrum, the proportion should be three pounds to the thousand cubic feet, with an exposure of three hours, and it is better to work on the principle of three pounds in three pots, or one pound to the pot, rather than use the three pounds in one pot. Water is to be used in pots, as for sulphur, and the same precautions used to prevent fire.

When the room fumigated with pyrethrum is opened up, the sheet is to be examined, the number of mosquitoes noted, and then the latter brushed into the still smoking pot. The floor of the room should also be swept rapidly, and the insects gathered up and thrown into the pot. A little alcohol may be carefully added from a cup to hasten the process. Alcohol must not be poured from the bottle, however, or accidents will happen.

In closing up a room for either sulphur or pyrethrum fumigation, the foreman should write on strip of paper closing the door the time that fumigation was started. He should also note it in his memorandum book, but this writing on the strip of paper will often prevent disputes with householders as to the time when the room should be opened.

12. The fumigation being well started, the foreman will take his gang and go to the next house, and at the expiration of two hours he should send back a man to open up a house being fumigated with sulphur.

A house fumigated by pyrethrum is to be opened up at the end of three hours, and two men had better be sent to do this, as the opening up of the room and sweeping up of insects must be done rapidly, since they are not always killed by the smoke, but only stupefied. No pots should be lighted after 4 p.m., in order that householders may not be kept out of their houses after nightfall. The men should be told off in rotation to open up the last house, and in this way a man will have to work overtime only one afternoon in five.

13. When the police are sent round to force entrance into premises, the Officer is to be the spokesman, and the foreman and his gang are not to interfere, unless the policeman is assailed and calls on them for assistance.

When a room has been broken open for fumigation by the police, a label to that effect is to be pasted over doors when the pots have been taken out. In addition, the door must be again securely nailed up, and a second label pasted over it stating that further fumigation of that particular room will not be necessary as long as this seal, which is pasted over the door in such a way that to open the door is to tear the paper, is unbroken. A similar label is to be used over doors of rooms which the householder states are not used. By this method, when a house is entered the second time for fumigation, the rooms which have unbroken seals on doors and windows need not be again fumigated.

Foremen must remember that they are invading the property of homes and disturbing the comforts of individuals. They must expect tongue lashings and other abuse, as part of their day's work for which they are being paid. They must keep their temper, try to make friends with these people, and *do the work* assigned them.

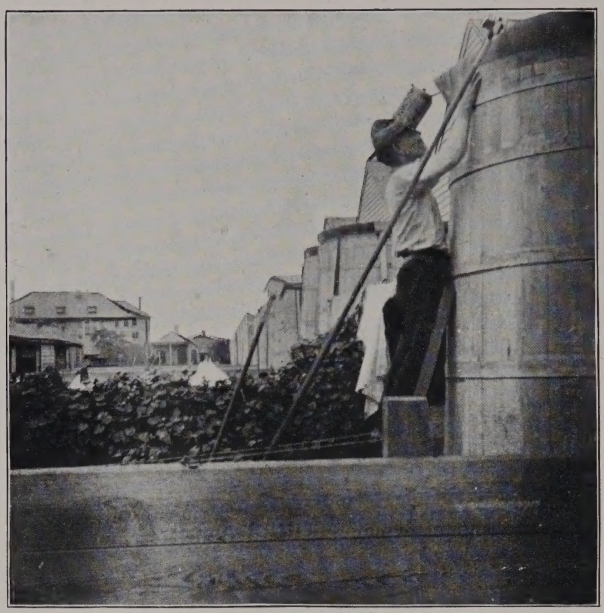


FIG. 11. Screening the Cisterns, New Orleans.
(From Report on Yellow Fever, British Honduras, 1905).

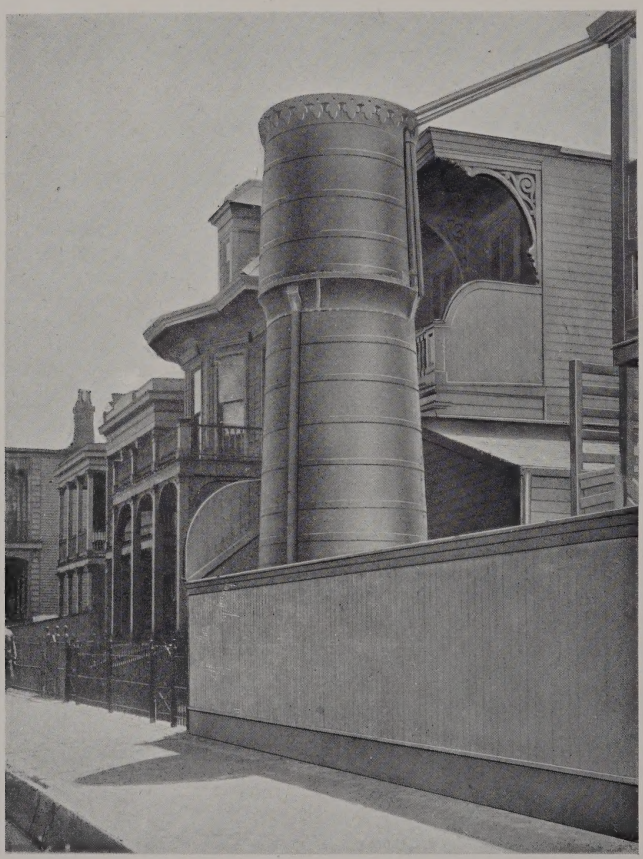


FIG. 12. A Properly Screened Cistern, New Orleans.

10. *Extension of Number of Days of Reinspection after Fumigation.*

This order was issued on August 30th, when no stone was being left unturned to grapple with the situation.

To Officers in Charge of Wards:

The instructions given you at the beginning of the present work included the reinspection of infected foci, from the 10th to the 25th day inclusive after the occurrence of first cases, in order that possible secondary cases might be discovered and properly treated. This reinspection is of such importance, that it has been decided to alter and extend it to include the 15th to the 30th day after the infecting case, and you are hereby instructed to alter the inspection time to the period stated.

You will acknowledge the receipt of this letter.

J. H. White.

11. *Fumigation Ordered before the Funeral in case of Death.*

To Officers in Charge of Wards and Others Concerned:

You are informed that the co-operation of the various funeral directors of the City has been requested in the matter of fumigating houses where Yellow Fever deaths have occurred, as soon as possible after the death and before the funeral, and they have been furnished with lists of various Headquarters, in order that prompt notification may be given the proper authorities.

You are directed to act on all such requests as soon as received, so that there will be as little delay in the funeral arrangements as possible.

12. The following forms were used and were regularly filled in:—

Fumigation Report.

..... 1905

Gang No. .....

Street.	No.	Rooms fumigated.	Rooms not fumigated.	Remarks for non-fumigation.
Totals..				.....Foreman.

INSPECTOR'S REPORT.

Ward No. .....Street No.....
Number of persons living in premises .....
How many sick since April 1st? .....
What disease? .....
What Physician attended? .....
Is cistern oiled, and is it properly screened? If oiled, when was it oiled? .....
.....
What is condition of privy vault? .....
Has it been oiled, and when? .....
Any wells, pits or holes on premises containing water? .....
Any barrels, tubs, flower pots, cans or other receptacles containing water?.....
.....
Are there any gutters containing stagnant water?.....
What is general sanitary condition of premises? Give details, if not good .....
.....

GENERAL REMARKS AND RECOMMENDATIONS.

.....
.....
(Under this head, if lot is empty, state whether there is any stagnant water on it.)
.....
.....
.....
Name of Inspector .....
Date—New Orleans .....

Seal placed on door of room by fumigator:

"If this seal is not broken the room will not require further fumigation."

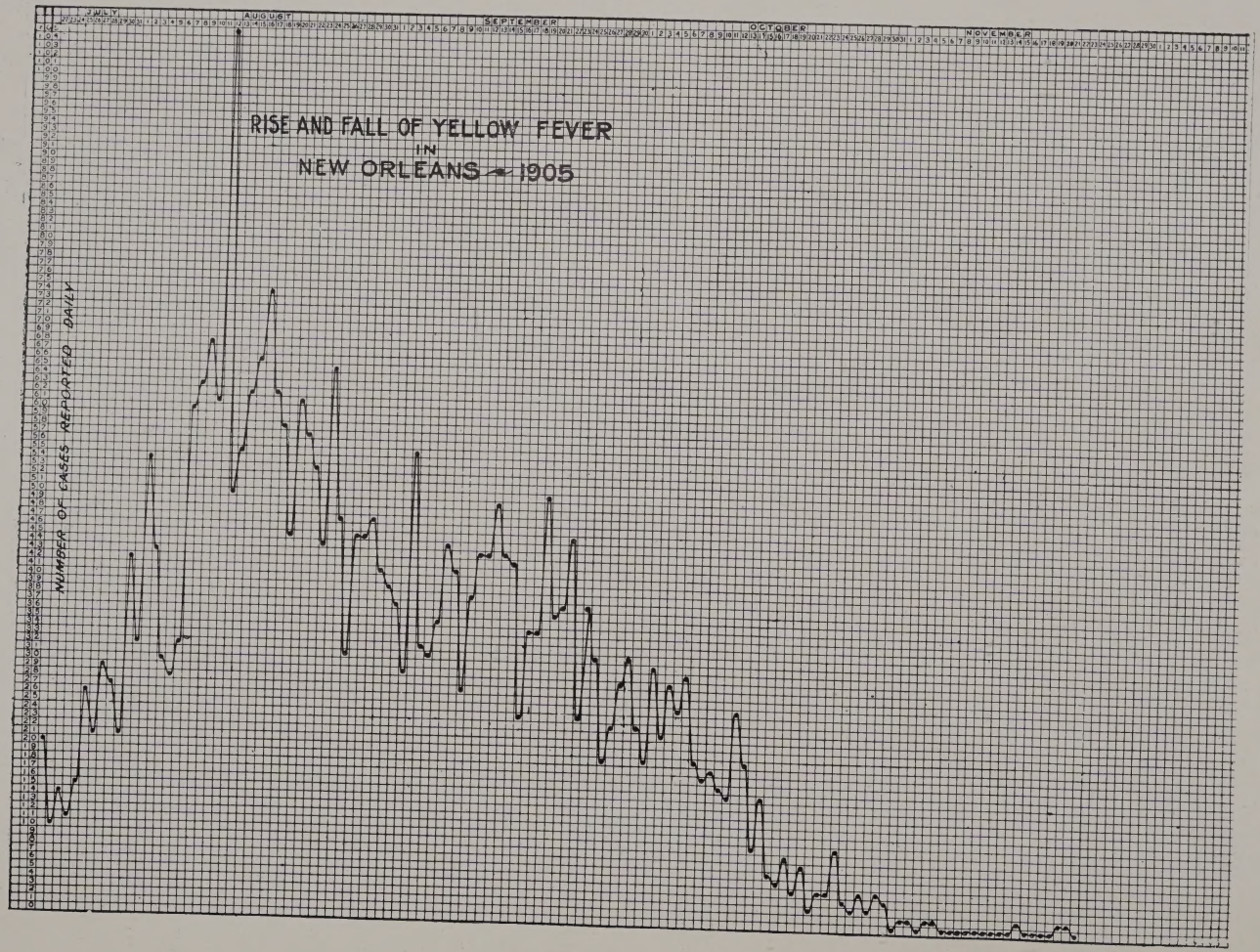
Warning attached to screen door of patient's room:

WARNING.

"This screen door must not be left open a minute for any reason whatever. If this screen door is found broken or propped open or the netting of the doors or windows torn, or cut, it will be sufficient cause to remove the patient to the Emergency Hospital."

PROGRESS OF THE FEVER.

Yellow Fever was officially declared on July 22nd, 1905, and on that date it is estimated that there were twenty cases. We have, however, every reason to believe that at that period there were far more cases, and that the disease had already spread over a very considerable area of the Italian quarter of the City. Examination of the Chart prepared by Dr. Quitman Kohnke shows that from July 22nd to August the 12th, on which date 105 cases were notified, the rise was exceedingly steep. It is probable that the estimate of 105 cases on the 12th of August, by which time the importance of early


RISE AND FALL OF YELLOW FEVER
IN
NEW ORLEANS — 1905
NUMBER OF CASES REPORTED DAILY
JULY
AUGUST
SEPTEMBER
OCTOBER
NOVEMBER

diagnosis had commenced to be realised, is more accurate than the estimated figure on the 22nd July, and that in reality the rise was more gradual from a much higher figure than 20 on the 22nd.

From the 12th July, when two very suspicious cases were privately reported, up to August the 4th, the local authorities dealt with the situation with increasing vigour. First, there were the measures undertaken by the State and Municipal Health Authorities. In spite of their efforts, however, the fever gained. Then on July the 22nd the campaign was taken up by the medical and citizens' Ward organisations working together with the local Health Authorities, and early notification and fumigation was universally advocated. On August 2nd, the screening of cisterns was made compulsory, and between 60,000 and 70,000 cisterns were screened in the course of a few days. This wise measure, however, would not produce an immediate effect in reducing the number of cases, for by this time the volume of infected mosquitoes in the houses would be very great; its effect would be seen later when the mosquitoes infected prior to the Ordinance having been killed by the repeated fumigations, there would be no fresh supplies of mosquitoes to take the place of those which were destroyed. As one would expect, therefore, the fever still increased, and on August the 4th it was decided to ask the Public Health and Marine Hospital Service to continue and perfect the campaign against the fever. On the 12th the fever reached its maximum point of 105, on the 17th the numbers were 74 and from this date onwards there was an absolutely steady fall into the first week in October, when the drop became more accentuated and two or three cases were reported on the average daily. It is clear that by August the 12th, the prophylactic measures, including early notification, isolation, fumigation, and cistern screening had begun to tell in no unmistakable manner, and that the Public Health and Marine Hospital Service Officers by most strenuous efforts and the exercise of the greatest vigilance and precision had made the occurrence of a subsequent recrudescence impossible. In three weeks time from the first official notification the fever was held absolutely under control, and was thenceforward week by week steadily driven back. There can be no doubt that the rigid control of the situation which commenced to be exercised after the 4th, was the great factor in preventing fresh outbreaks. The Chart is a splendid example of what

can be accomplished by modern prophylaxis. The campaign was started under most unfavourable conditions, for it is clear that there was a vast volume of infection in the most difficult district to deal with in New Orleans, containing for the most part non-immunes, who were adverse to medical advice and treatment. There did not even exist an hospital for infectious cases, and the climatic conditions were the worst possible, as the Season was unusually hot and close. The most striking evidence of the extraordinary difference of the results of the prophylactic measures adopted in this campaign as compared with previous epidemics in New Orleans is furnished by comparison with the number of cases on corresponding dates in the previous epidemics. Thus in the epidemic of 1898 two cases are reported on the 24th July; on August 12th there are 31 new cases; on the 14th the new cases were 134; steady increase takes place and on the 31st August the new cases are 234. Increase still takes place, and this, too, in spite of the adoption of all the methods then known to science, and which consisted in most rigid house quarantine; towards the end of September there is slight decrease, but in the first week in October as many as 305 new cases are reported on the 4th; the figures then slowly decrease to an average of about 60 new cases in the first week in November and after that the frost brings the fever to a close. The total number of cases were 13,817 with 3,984 deaths, as compared with 3,384 and 443 deaths in 1905. It would be impossible to obtain more striking figures of the thorough control which the organised medical forces had over the fever by the end of the first week in August, and solely by adopting one line of attack—the destruction of the *Stegomyia fasciata* in the houses, prevention of their breeding in the water cisterns and early recognition and screening of the cases.

IV.—The Press and Educational Campaign.

From day to day the Press of New Orleans closely followed the progress of events. They were in constant touch with the Authorities and shared with the latter to the full the necessity of not alarming the public, but rather of reassuring them, and giving the fullest possible publicity to all sanitary measures issued by those in charge of the campaign. Thus in the commencement of the outbreak, there are no sensational headlines, indeed, the fact of the presence of

fever in New Orleans is only gathered by the headlines that "Quarantines are on," and that certain States and towns in the neighbourhood are becoming alarmed. Subsequently, they usually, each day, devoted a whole page or even more to an account of the previous day's progress of the fever, to the meetings of Health Officers, and other official meetings, to full accounts of lectures given in the evenings by properly authorised persons, and to descriptive articles upon the beneficial results which had followed Anti-Yellow Fever and anti-malarial measures in different parts of the world. At no time does an antagonistic note appear to have been struck. The Press, reflecting the feelings of the community, were intensely loyal, put the fullest confidence in those who were charged with the conduct of the campaign, and avoided taking any premature steps which might have interfered with the satisfactory progress of official work. The result was that they always appeared to me to enjoy the full confidence of the Authorities. Together with the Citizens' Ward Organisation they took a leading share in stimulating all classes of society to a sense of their duty in the emergency, and of impressing upon the public the necessity of going about their work cheerfully and with complete confidence in their ultimate success. At no time did New Orleans ever appear depressed, indeed, the motto, ascribed to the Rev. Dr. Warner which was hung up everywhere in hotels and public places, "Wear a smile on your face and a flower in your button-hole," was acted upon. Another result of the wide publicity given by the Press to the nature of Yellow Fever and of its relationship to *Stegomyia fasciata*, was that when I arrived in New Orleans in August, doubters of the true way in which Yellow Fever was carried would have fared very ill. Everyone felt that it was not a time for two opinions, and that there was only one safe line of action—implicit belief in the teaching of Reed, Carroll, Agramonte and Lazear. In this respect the campaign was a triumph for medical science. In a few days with exceedingly little opposition, sixty to seventy thousand cisterns had been screened in order to prevent the breeding of the *Stegomyia fasciata*. Mosquito nets became more than ever the rule, and the richer inhabitants in the suburbs went to considerable expense in wire screening the verandahs and rooms of very many of their houses, and a badge worn in the button-hole with the image of the Stegomyia and the words "Have you screened your cisterns? I have mine," was

very commonly worn by the younger members of the community. When it is recollected that New Orleans possesses very diverse elements, that there are newspapers in English and in French, that there is a very large Italian population, and that there are corresponding religious differences, it is a very striking fact that literally in a few days there should have been complete unanimity and enthusiasm as regards the plan of campaign. I reproduce some of the headings and other data which appeared in one of the leading daily journals ("The Daily Picayune"). On July 22nd, that is five days after the official announcement of Yellow Fever is made, the following headlines appeared, which sufficiently indicate that the campaign had started on right lines.

CLEAN-UP CLUBS FORMING IN EVERY CITY SECTION.
ALL WITH THE PATRIOTIC PURPOSE OF AIDING AUTHORITIES IN CONQUERING DISEASE.
AND PROVING TO THE WORLD THAT SCIENCE HAS REMOVED NECESSITY FOR FEAR.
EDUCATIONAL CAMPAIGN ON THE DANGEROUS MOSQUITO BEING EXPOSED AND WELL FOUGHT.
14TH WARD MAKES WHOLESALE CONTRACT FOR CISTERN SCREENS AT A DOLLAR EACH.

On August the 3rd the newspapers gave great prominence to the importance of re-oiling the cisterns owing to the fact that a heavy rain-storm had washed the oil out. The following is an example:—

Oil again and keep on oiling. Until screens are in place and pest exterminated. Volunteer Forces urged to maintain the ground gained. Inspectors will make sure of campaign's efficiency. A noteworthy series of educational mass meetings to be inaugurated to-night.

Further on again the following occurs:—

Oil again. Keep a weather eye on the rain barrel. After a second oiling, then screen before another overflow washes away the good effect. Where re-oiling of cisterns did not start yesterday, it will be begun to-day. This was the advice sent out from Dr. Beverley Warner's headquarters of the Citizens' Volunteer Ward Organisations. The day's energy in fact was devoted to re-oiling. At least three-fifths of the cisterns of the whole City had been gotten in good shape when the rain and thunder-storm of Tuesday evening caused an overflow of cisterns and a loss of oil. The barrels of liquid that had been dumped into cisterns in all sorts of fashion were flowing over the town in the open gutters.

"The one message that I wish to send out from headquarters to-day," said Dr. Warner, "is that it is absolutely necessary to oil cisterns again. All of them did not overflow, but two-thirds did, and the oil has been lost. Then if we can get them screened before another overflow, we will be all right. Oil again. I hope the papers will preach that to-morrow morning. In some of the wards where screening was in progress the crews were taken off the screening and put to oiling again."

On the same date the following announcement is also made:—

EITHER MOSQUITOES OR MEN MUST RULE.
THE QUESTION PLAINLY PUT BEFORE THE PEOPLE HERE.
IN THE FIRST OF GENERAL EDUCATIONAL MASS MEETINGS.
LEADERS IN SCIENCE PRESENTING TRUTH OF MOSQUITO THEORY.
AND URGING THE PEOPLE TO STAMP OUT THE PEST AND
REDEEM THE CITY FOR EVER.

The first gun of the educational warfare against the stegomyia was fired last night, when the inaugural mass meeting of the respective wards was called to order in the First Ward by the Hon. C. Taylor Gauche. It is proposed to hold public meetings in every ward of the City, and through speakers, well versed in the elucidation of the questions of vital importance to the health and prosperity of New Orleans, to thoroughly and accurately inform the people and to teach them with regard to the now accepted fact that the stegomyia mosquito is the conveyor of Yellow Fever, and that the extinction of the pestiferous insect now will mean absolute freedom from Yellow Fever for all time to come.

The following day practical suggestions were also published:—

VALUABLE SUGGESTIONS (from a Local Medical Man).

Don't put any more gangs to work than you have trustworthy foremen for; the oiling and screening must be as thorough, complete and effective as the preparations for an aseptic operation.

Get the ladies of your ward to make you numbers of carpenters' aprons. You will need them when you get to screening.

Get the ladies to provide bits of pasteboard or woollen stuff about one inch square to run your screening tacks through. They hold the cheesecloth much better.

Don't economize on tacks. The mosquito can creep through very small holes.

Screening gangs need plenty of hammers and shears. Better lay in a full supply.

Keep accurate account of premises to which you are denied entrance, of empty houses into which you cannot get, and of those where the tenant makes himself responsible for the oiling and screening. These will provide the breaches through which the enemy will find entrance, if they are not stopped.

Inspect and re-inspect all work done, by the most intelligent and conscientious inspectors you can find.

All inlet pipes of 10 feet long or over should be screened and lower ends of all outlet pipes covered with cheesecloth securely tacked or tied.

The end of outlet pipes may be immersed in a pail of water, which can be kept oiled by the householder.

All householders should be asked to sweep standing water out of the gutters. Where they cannot attend to it, screening gangs should look to it.

On the date appointed for the cleaning of the City the announcement in the Press is:—

Greatest cleaning the City has ever enjoined. Thousands of men and carts to be engaged in to-day's battle against dirt. And City Administration will seek to make permanent the improvement which the forces expect to secure.

The result of the cleaning was, indeed, manifest, the accumulations of years was got rid of and the City made far more wholesome. Some 800 extra labourers were employed and 250 carts. It was pointed out that this cleaning whilst it did not necessarily affect the

Stegomyia or the progress of the Yellow Fever, was, nevertheless, most advisable upon general sanitary grounds.

Upon August the 6th is published the results of the first week's working of the Citizens' Volunteer Ward Organisation. It is a sample of the work done at the stage when the Public Health and Marine Hospital Service had not taken over the campaign.

A summary of the work done in the several wards by volunteer committees for the first week during which Dr. Beverley Warner has been in command as General Superintendent, was compiled in his office yesterday. It is not perfect owing to the extreme difficulty of getting prompt responses from the ward executives who are so busily engaged in the work. It will give the residents of New Orleans an idea of what has been done so far. The summary follows :—

First Ward.—Number of men employed, 28 ; cisterns oiled, 3,216 ; screened, 310 ; cesspools treated, 2,926.

Second Ward.—Men employed, 96 ; cisterns oiled, 3,975 ; screened, 469 ; cesspools treated, 2,611.

Third Ward.—Cisterns oiled, 9,000 ; screened, 9,000.

Fourth Ward.—Men employed, 25 ; cisterns oiled, 3,200 ; screened, 1,000 ; cesspools treated, 3,100.

Fifth Ward.—Cisterns oiled, 1,480 ; screened, 86.

Sixth Ward.—Men employed, 16 ; cisterns oiled, 2,384 ; screened, 67 ; cesspools, 2,033.

Seventh Ward.—Men employed, 115 ; cisterns oiled, 3,200 ; screened, 500 ; cesspools treated, 2,500.

Eighth Ward.—Cisterns oiled, 603 ; screened, 31 ; cesspools treated, 183.

Ninth Ward.—Men employed, 214 ; cisterns oiled, 1,563 ; screened, 197 ; cesspools, 233.

Tenth Ward.—Men employed, 25 ; cisterns oiled, 1,114 ; cisterns screened, 1,114 ; cesspools treated, 1,114. Tenth Ward (Middle Section) : Men employed, 77 ; entirely oiled, and 37 squares screened.

Eleventh Ward.—Entire ward oiled and one-third screened. Cesspools treated, entire ward.

Twelfth Ward.—Cisterns oiled, 2,596 ; screened, 934 ; cesspools treated, 2,620.

Thirteenth Ward.—Entirely oiled.

Fourteenth Ward.—Cisterns and cesspools entirely oiled ; screened, 1,405.

Fifteenth Ward.—Men employed, 12 ; cisterns oiled, 1,609 ; screened, 200 ; cesspools treated, 1,609.

Sixteenth and Seventeenth Wards.—Men employed, 18 ; cisterns oiled, 1,932 ; screened, 98 ; cesspools treated, 757.

There have been 660 stagnant water pools covered.

Speaking of this first weekly report, Dr. Warner said :—

"It is a revelation of patriotism and loyalty to the City of which we should all be proud. Anyone who has ever been engaged on such work on so large a scale is aware of the infinite number of hindrances and embarrassments that are sure to arise. How these have been met and overcome by the ward officers I am in a position to know perhaps better than anyone else ; how faithful the volunteers have served amid inevitable criticism and the occasional indifference on the part of those for whom their services are rendered we also know. By the middle of this week the work of oiling and screening will probably be entirely accomplished. This is but the beginning of the fight."

On August 17th the Press make the announcement that Sunday, August 20th, is to be made a general fumigation day and publish the following statement:—

It is incumbent on every good citizen to use the means God has placed in his or her hands to prevent Yellow Fever from becoming epidemic and to lessen the future chance of further infection.

It is an absolutely established fact that the disease is communicated from person to person by the mosquito alone.

The screening and oiling that has been done will destroy the chance of new broods of mosquitoes hatching. The mosquitoes that were hatched before the screening and oiling were done, are still about the City in vast numbers, and are, in the present crisis, liable to become as dangerous as so many rattlesnakes.

To get rid of these mosquitoes requires fumigation by sulphur fumes. This fumigation, to be effective, must be done by a preconcerted, organized movement by all the citizens and householders of this City, on a given day and at a given time.

If every room and inclosed space within the limits of New Orleans is fumigated on the same day and at the same hour with sulphur fumes, and for two full hours, the mosquitoes will be destroyed, and the medium of Yellow Fever infection removed, so that within a week from the date of this general fumigation of the whole City the table of new cases published daily will fall to a small percentage of what it is at present.

Therefore we appeal to every householder, every boarding or lodging house keeper, every hotel keeper, every merchant and manufacturer, every person occupying any inclosed premises of any nature, whether it be a stable or a room in an office building, to see that

NEXT SUNDAY, AUGUST 20TH, AT 10 O'CLOCK A.M.,

any and every room or enclosed space under their control is fumigated for at least two hours with sulphur fumes, in accordance with the directions of the Marine Hospital Service, which will be published. BEVERLEY WARNER,

General Superintendent.

On August 25th, after a month's work, the Press make the following encouraging announcement:—

Last night closed the first month's struggle of the City of New Orleans against Yellow Fever. Probably no city in America has ever made such a valiant fight against disease as has been made by the citizens of this City and State, who have contributed their money and their labor to stamp out the mosquito pest and stop the spread of fever.

An army of men has been enlisted in this sanitary war. A fund of a quarter of a million of dollars has been raised and is being expended, with probably as much again having been contributed to the fight in one way or another.

During the first month business was practically suspended for one day, and everyone devoted their energies to cleansing and scrubbing the City.

Thousands of men have worked in the streets, and hundreds of carts have been employed carting away the scrubbings.

To-day the whole City will fumigate. Sulphur has been secured by the carload, probably about twenty cars, and it has been distributed among the wards for free distribution among those unable to buy, and at 10 o'clock this morning every house is expected to be fumigated with sulphur, thereby killing mosquitoes that may be hiding in dark corners and crevices. Everyone is again urged to fumigate. By everyone smoking them out at the same time it does not leave places of refuge in which the stegomyia can seek and find a safe haven. If everyone follows instructions to-day there will be a widespread slaughter of the *Stegomyia fasciata*, and to that end the spread of fever largely checked.

To-morrow at 10.30, the churches have arranged for an hour of prayer, when all denominations will meet at the Y.M.C.A. Hall and ask God's blessing on the heroic work of the men and women of this fair City. All ministers, irrespective of their creeds and denominations, are urged to join in this union prayer service and to ask their congregations to attend.

Last night marked the close of the third week of the work of Dr. Beverley Warner and his volunteer department. When asked for a summary of the situation up to date, Dr. Warner said :—

"We are beginning to see very clearly the effects of the work accomplished both by the Marine Hospital Service and by the Volunteer Organizations. The fever is not as rampant as we would have expected from the first reports at the end of July. This is owing, first, to the preparatory work done by the City ; second, and of most importance, of course, to the careful and faithful efforts of the Marine Hospital Service, under the direction of Dr. White.

"The public is already reassured, and, to judge from the evidence of the mass meetings are not only interested in the discussions, but are impressed more and more with the mosquito theory. The most important event of the week was the adding of Dr. Juan Guiteras to the ranks of the volunteer speakers. This will give the people in all sections of the City an opportunity of seeing and hearing Dr. Guiteras. It is the universal verdict that he carries conviction of the truths he advocates.

"We close the week with a feeling of enlarged hope and greater courage."

Garlick, the billposter, has done a unique thing, and one that appeals to Dr. Warner as a splendid contribution to the great cause, and that is the printing of several thousand large posters, in red ink, telling in a word of the absolute proof of the mosquito theory, and urging the people to fumigate and carry out the mandates of the Federal authorities. These posters were sent all over the City and placed on the Garlick boards free of charge.

IN A NUT SHELL
WE ALL KNOW THE DANGER OF
YELLOW FEVER
but we become EARNEST ONLY
after it claims our own blood.
INFECTION BY MOSQUITOES
IS NO LONGER A THEORY
BUT A PROVEN FACT
GET RID OF THE MOSQUITO
BY BURNING
SULPHUR FOR FUMIGATION
UNDER THE DIRECTION OF THE
MARINE HOSPITAL SERVICE
START IN ON
SUNDAY AT 10 A M.
AND KEEP AT IT UNTIL NOON
OR LATER

Copy of Poster issued.

A sulphur depôt was established for the Fourteenth Ward at No. 6,053, Constance Street, yesterday, with J. J. Beahr in charge. This is for the aid of the poor in that ward.

Three more cars of sulphur were received yesterday and reported to Dr. Warner for the use of the wards in distributing to the poor.

Two important meetings have been scheduled for to-night. The one at the First Baptist Church, on Magazine, near Washington Avenue, will be addressed by Dr. J. H. White, Dr. Pothier, Dr. Warner, Rev. C. V. Edwards, and others.

An important meeting has also been billed for the coloured church on Austerlitz Street, between Magazine and Constance, to-night at 8 o'clock, which will be addressed by Dr. Kohnke and others.

Monday night will witness three large mass meetings. Touro Synagogue will be one of them, where Drs. Guiteras, Bloom, Matas, Fenner and Warner will speak. Time, 8 o'clock.

Y.M.C.A. Hall, 8 p.m., addresses by Drs. Guiteras, Sexton, Kohnke and others.

Presbyterian Church, Euterpe and South Franklin Streets, addresses by Drs. Smith and Metz and Prof. Beyer. Time, 8 o'clock.

On Tuesday night, Bishop Davis Sessums and Dr. Kohnke will be leading speakers at a big coloured mass meeting in the First M.E. Church, corner First and Dryades Streets.

These concluding paragraphs of the month's work give a very good idea of the extent of the educational campaign. Lectures were fixed for almost every evening during which the fever lasted, and by these means all classes of the community were reached. Dr. Warner who, as we have seen, as superintendent of the Volunteer Ward Organisation, took the lead in organising the educational campaign, was also enthusiastically supported in this movement by the Home and Education Department of the Woman's League. Under the chairmanship of Mrs. W. J. Behan a very large number of popular lectures were organised both indoors and in the public Park. Indeed, they appear to have commenced the educational movement before the outbreak of the Fever. They also did not confine themselves to lectures, but by forming Ward Clubs and appointing visitors they assisted in urging the necessity upon each householder of oiling and screening.

V.—The Financial Organisation.

A campaign of the magnitude of that which took place in New Orleans in 1905 could not have been successfully conducted unless there had been liberal financial support. The necessary large sums of money to undertake the prophylactic measures were, with very great promptness and generosity, subscribed by all classes of citizens. I will conclude this description of the 1905 Yellow Fever epidemic with the following statement kindly furnished to me by Mr. Janvier, Chairman of the Yellow Fever Fund, of how the funds were raised.

Citizens' Yellow Fever Fund Committee.

New Orleans, *September* 15, 1905.

On Friday, July 22nd, 1905, the Mayor of the City of New Orleans invited the State and City Health Officers and a number of citizens prominent in business and professional life, to meet in his office for the purpose of conferring upon the fever situation. This conference was held on Saturday, July 23rd, and at this conference a Finance Committee was named by the Mayor and charged with the duty of gathering the funds requisite to carry on a fight against the fever then prevalent. This Committee set to work without delay soliciting contributions. The Committee began operations with a fund of $20,000.00 which had been placed in our hands by the associated banks of the City, and within a few days contributions began to come in generally and generously. When it was realized that the local authorities—State and Municipal—were unable to satisfactorily cope with the situation, and an appeal was made to the Governor of the State to request the Federal or General Government to take charge, the Committee had accumulated about $60,000.00. On Sunday morning, Aug. 7th, Dr. J. H. White, who had been sent to New Orleans by the U.S. Public Health and Marine Hospital Service, received the following telegram from Dr. Wyman, the head of that branch of the general Government :—

"Surgeon White, St. Charles Hotel, New Orleans, La. In answer to telegram of Aug. 4th you state that the citizens have raised a large fund and promise to raise more, though amount is not definitely stated.

"It is very important that this matter should be settled before definite action can be taken. Your estimate in second telegram of Aug. 4th, makes total expenses for eradication at $1,500.00 to $2,000.00 per day.

"You do not state whether this amount is expected of the Service. Bureau estimate for forty officers, mentioned by you as being required, would be about $500.00 per day. The epidemic fund will not stand or permit of $1,500.00 to $2,000.00 per day. This is absolute. Bureau would be willing to give you all the medical officers necessary, but the labor and materials should be furnished by the citizens, as has been done heretofore.

"Wire promptly whether this arrangement can be effected, that I may give my opinion to the President.

"Attention should be called to the fact that the Government is now maintaining detention camps in the interest of New Orleans, and expense must be met for interstate measures. Rush answer. Wyman."

Upon receipt of this telegram Dr. White requested an immediate conference with the Mayor of the City and the Citizens' Finance Committee. As a result of this conference, the following telegrams were dispatched to the President of the United States and Surgeon-General Wyman :—

"Surgeon-General Wyman, Washington, D.C. The citizens of New Orleans pledge themselves to secure and furnish all the funds necessary to pay the expenses which your service may incur for labor and materials in dealing with situation here. This in accordance with Dr. White's telegram to you. Martin Behrman (Mayor), Charles Janvier, Gus. Lehmann, Sr., Wm. Adler, W. G. Tebault, Citizens' Committee."

This telegram was sent to President Roosevelt, at Oyster Bay :—

"The President, Oyster Bay, New York. We heartily thank you for your prompt and generous action which, though expected, was none the less most gratifying. We pledge ourselves to do our share, and have wired Surgeon-General Wyman that we would secure and furnish all the funds the service may require. Martin Behrman (Mayor), Charles Janvier, Gus. Lehmann, Sr., Wm. Adler, W. G. Tebault, Citizens' Committee."

These telegrams were followed by the following from Dr. White to Surgeon-General Wyman :—

"New Orleans, Aug. 6th. Citizens' conference wires to-day that if you furnish the officers they will furnish $3,000.00 per day, if needed. They begin with sixty-odd thousand in hand and can easily raise the rest. They give us authority to discharge and employ and in no way tie our hands. No offer could be more frank, and I unreservedly recommend that we accept the trust at the earliest possible moment, because time is extremely valuable. J. H. White."

"New Orleans, Aug. 6th. Funds promised for work by bankers, merchants and Mayor, will be disbursed by Colonel Janvier and rolls kept under his orders. Mayor verbally promises in open conference to supplement if need be, and to give full police authority. The Committee's telegram to you, signed by the Mayor and several wealthy men, sufficient written agreement. City ordinances, including one recently passed, are sufficient. J. H. White."

The Finance Committee prepared and had published in the newspapers the next morning the following appeal to the people of the City :—

"New Orleans, La., Aug. 6th, 1905. To the Citizens of New Orleans : We respectfully ask your earnest attention to the telegram from Surgeon-General Wyman, of the United States Public Health and Marine Hospital Service, in which are stated the conditions under which the Service will assume control of the fever situation here. As immediate action was imperative, Mayor Behrman agreed at once to these conditions, and in your behalf we gave the pledge that you would contribute the funds which might be required in the prosecution of the fight. The undersigned Committee has now in hand about $70,000.00. A very much larger sum than this will be needed, and we should be able in a few days to place at the command of the Federal authorities at least $250,000.00. The State and City can be counted on to do their duty, but the individual citizen must do his. The people of New Orleans, in times of emergency, have never faltered or failed and we appeal to you to indorse and redeem the pledge made by us in your behalf. Not one dollar of the funds contributed will be spent except under the direction of the United States Public Health and Marine Hospital Service. Contributions will be received by Charles Janvier, Chairman, at the Canal Bank and Trust Co. Charles Janvier (Chairman), Gus. Lehmann, Sr., Wm. Adler, W. G. Tebault, Finance Committee, Yellow Fever Fund."

The responses to this appeal were prompt and liberal and in a few days the fund had increased to $100,000.00. The Governor of the State had promised that when called upon the State would help, and on the 7th of August I wired His Excellency as follows :—

"To Governor N. C. Blanchard, Baton Rouge, La. We appeal to the State of Louisiana for financial aid in the present emergency. The citizens of New Orleans have given their pledge to the United States Government that the funds required by the United States Public Health and Marine Hospital Service would be furnished and

have given the assurance that the State and City could be counted on to do their share. The people are responding generously to the appeal. The emergency warrants you in taking in the present instance the same steps to furnish the aid we ask as were taken by your predecessors in similar emergencies, notably the drought and high water emergencies and the Yellow Fever epidemic of 1897. Charles Janvier, Chairman, Citizens' Yellow Fever Committee."

The Fiscal Agents of the State at the same time wired the Governor that they stood ready to advance to the State at the rate of two per cent. per annum the money which might be required, upon the assurance from him that the Legislature of the State would include such advance in the Appropriation Bill at the next session of the General Assembly. Promptly upon receipt of my wire, the Governor replied as follows:—

"The State should help New Orleans financially and every other way in this emergency, and she will. Am getting into communication with legislators. Will make the loan as soon as I have heard from a sufficient number. I think it will be all right. Go ahead. N. C. Blanchard, Governor."

In a few days the Governor, in response to his telegraphic inquiries, received pledges from more than a majority of the members of the General Assembly that they would at the next session vote for the appropriation of $100,000.00, for the purpose of helping the people of New Orleans in their fight against the fever, and the Governor informed me at once that the State was prepared to help to that extent and would increase the amount if the necessity for so doing should arise. (It is interesting to note at this point that the Governor finally heard from all the members of the General Assembly and there was not one single dissenting voice.) In the meanwhile, the Mayor of the City had called the City Council in conference and in due course the Council passed by unanimous vote an ordinance, on Aug. 17th, 1905, authorizing the Mayor to effect a loan with the City's Fiscal Agents and place at the disposal of the Citizens' Yellow Fever Fund Committee the sum of $50,000.00.

While the sum of $250,000.00, which the Committee in its appeal stated would be necessary, had been thus secured, the Committee did not cease their efforts to still further augment the fund, and at the present writing the Citizens' Yellow Fever Fund amounts to over $137,000.00.

The Governor has been obliged to divert $20,000.00 of the State fund to help other sections of the State, leaving $80,000.00 still at our command from the State.

The amount of money, therefore, that we have raised up to the present time is over $267,000.00, which should be sufficient to pay all the expenses of the campaign, and leave a handsome balance in our hands. We desire when this fight is over to construct, equip and maintain an Isolation Hospital of the very finest character, for the care and treatment of contagious and infectious diseases, and to that great purpose will be applied whatever sum may be left in our hands at the conclusion of the present fight.

I trust that the foregoing gives you all the information you desire in connection with the financial side of our present struggle.

Yours respectfully,

CHARLES JANVIER,
Chairman, Citizens' Yellow Fever Fund Committee.

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